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ABSTRACT

Fifteen papers from the University of South Africa's Conference on Distance Education are presented on media and technology. They include: "Video Education: What Went Wrong and Why It Is Tomorrow's Teacher If Used Correctly" (William M. Smith); "Formative Evaluation of ETV Programmes" (Aliza Duby); "Distance Education for South African Adult Learners: The Role of Educational Technology" (Jeff Wolfson); "The Role of Radio and Television in Distance Education" (Anina Maree); "The Potential of Sound Cassettes in Distance Education" (Johan Freysen); "The Use of Satellites for Distance Education: A New Model for South Africa" (I. Ural); "Community Information for the Functionally Illiterate in South Africa by Means of Audio Cassettes" (A.P. du Plooy); "The Botswana Experiment: The Feasibility of Communication Technology in a Distance Learning Innovation in Southern Africa" (R. Kenneth Jones, Kathlene Higgins); "The Use of Audio-Cassettes in Distance Education" (Andre I. le Roux); "The Telephone at UNISA" (C.C. Herbst); "UNISA and Beltel: A Marriage of Convenience?" (Calvyn Potgieter); "The UNISA Beltel Project" (Jean-Paul Genot); "Communication Media and Distance Education (Media Design: An Integral Part of Course Design)" (C. Potgieter); "Supplying Library Materials to Undergraduate Students of a Distance Teaching University" (N. Shillinglaw); and "Post-Graduate Students and the Library at a Distance Teaching University" (Robert Poller). (LB)

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PAPERS 3.1

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Media and technology in distance education

DISTANCE EDUCATION IN SOUTHERN AFRICA: PREPARING FOR THE 21ST CENTURY

18 - 21 MAY 1987

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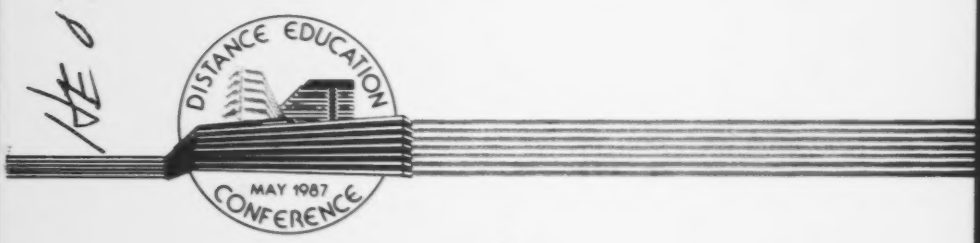

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PREFACE

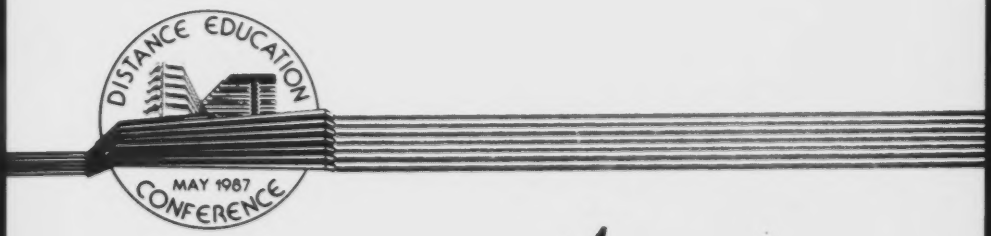
The conference papers to be presented at the University of South Africa's Conference on Distance Education are contained in a number of volumes for easy reference. The papers have been collected according to basic themes as follows:

The theory and practice of distance education	**Papers 1**
Issues in education and distance education	**Papers 2**
Media and technology in distance education	**Papers 3.1, 3.2**
Professional education and practical training at a distance	**Papers 4.1, 4.2**
Administration and student support in distance education	**Papers 5**
Systems and strategies in distance education	**Papers 6**

This is Volume 3.1 of the papers. The table of contents lists the papers in this volume in order of abstract numbers.

In the alphabetical index all participants' names, the abstract number of their paper, the session allocated and the volume in which the paper is published can be found. Not mentioned are papers that may be published in Volume 7 entitled "Late Submissions".

F. van den Bogaerde
CONFERENCE CHAIRMAN



KEY

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1000 SERIES — Participants from Africa and Abroad
2000 SERIES — Participants from southern Africa
3000 SERIES — Participants from the University of South Africa

3100 — Administrative and Professional
3200 — Faculty of Arts
3300 — Faculty of Education
3400 — Faculty of Economic and Management Sciences
3500 — Faculty of Law
3600 — Faculty of Science
3700 — Faculty of Theology

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PAPERS

VIDEO EDUCATION

What went wrong and why it is tomorrow's teacher if used correctly

William M Smith (M.Sc.)
Head: Argus Group
Newspaper Schools

WHAT WENT WRONG

Soon after video became part of our daily lives, video education became a reality. The advantages were obvious and everyone climbed in - from educational authorities to corporate companies. Each one had their own idea of what was to be done and each one did it their way. They bought conventional studios, put up blackboards and flip charts, brought in the person who had been doing training in the group situation and sat him down in front of the camera. Scripts had now to be written, checked and the tapes had to be viewed by all the experts. It was amazing how many "experts" there suddenly were. Production was changed - and changed again as no group ever seemed to reach full agreement.

So, by the time the production was complete, it had cost a fortune, the presenter had not been presenting in the manner he was used to, or was good at. He was no longer spontaneous. He was totally unfamiliar with the world of television and often totally unsuited to it. He had no idea of how to adapt this new medium to his subject and no-one could help him as no-one knew how. He felt uncomfortable and his viewers sensed it. They found the presentation awkward and boring.

When management counted the cost of the video production and related it to the effectiveness of the programme as an educational experience, they hesitated - and they are still hesitating today.

THE ONE-MAN STUDIO

In 1983 Star Schools was no longer able to accommodate all the pupils wishing to attend its classes. Alternative educational plans had to be made. Videos were an obvious choice.

It was soon realised that hundreds of hours of master material would be needed to offer any kind of service and the cost factor, at even as little as R200 per minute made the project uneconomic. It was also noted that very few educational video productions world-wide had even been able to pay for themselves. Because most of the cost of video production is largely that of labour, a special studio was developed which eliminated all production crew, except the presenter. It was an electronic wonder and it worked. In this way it was possible to produce a complete programme using only one person - and the costs dropped enormously.

However, it was the unexpected advantages of this unique approach to video production that has made the concept even more viable:-

1. The presenter, who knows his subject, normally writes a script to tell the production team what to do and since he is now producing his own programme, in the one-man studio, there is no longer any need for a script. No script enables him to be completely spontaneous during his presentation.

2. His inexperience and mistakes are only known to him. He does not have a costly production crew laughing at him or getting annoyed when he makes an error. He can simply, by pushing a button, wipe out his mistake and re-shoot the section.

3. He does not have to wait for 8 am and the arrival of the production team to start the production. He can produce programmes at any time to suit him.

4. The rate of production is very high. The record stands at 9 hours of master material (ready for copies) made in one 12-hour day.

5. The studios have been fitted into mobile caravans, which are then brought to a presenter's home or place of work, giving even greater flexibility.

6. The presenter is able to experiment with TV as a tuition medium at will and get to know its strengths and weaknesses as well as his own.

7. By being in full control of the entire operation of the studio the presenter is able to make split-second camera changes, zooming, etc., which adds to the impact of the production.

8. Electronically, the studio is able to offer all the necessary extras to compete with any studio used for educational purposes. The presenter can read off the teleprompt, feed in outside material, watch experiments, record results, fade, zoom and cut from camera to camera at will.

9. The new presenter needs about 30 minutes of instruction on the operation of the studio. After a few hours of familiarisation he is then ready to commence making his first master.

10. With modern technology it is possible to upgrade the existing studio to broadcast quality - a quality not necessary for normal educational tapes.

DISADVANTAGES

Video tuition, if done properly, has only one major disadvantage: it cannot adequately test the pupils' knowledge and hence offer progress reports on an individual basis, nor can it offer corrective measures where skills are lacking. A skilful presenter will, to a certain extent, be able to anticipate some of the areas where problems normally exist, but the video will never be as good as the teacher in the classroom in this regard.

Computers offer this testing aspect of education and they do it well. Unfortunately, many educators have burned their fingers attempting to turn the computer into a teacher - something which - in general, computers were never designed to do - and in most cases they do badly.

As soon as it becomes economically viable the ideal solution is going to be to marry the video and the computer together and get the best of both worlds.

THE FUTURE

Under the present system of video production with its high costs and low returns, there appears to be a very limited future in educational videos.

The one-man studio, developed and patented by Star Schools, has opened the doors to video education for the future. The productions are entertaining, spontaneous and are brought alive by outside material and experimentation. The studio and the presenter become one - and the results are exciting.

The costs have been so drastically reduced that it is now possible to make a video production for as little as R10 per minute. It is now cheaper to make a video on the new system than to write a script for the conventional studio production.

While editing is done at the same time as the video is being made, there is no post production editing stage, which reduces picture-quality loss and further expense.

It is now possible to take a mobile studio to the home of the best maths teacher in Africa, link into his home power supply and produce master

videos, the copies of which can reach the whole of Africa.

The studios themselves are inexpensive, costing in the region of R120 000 for the complete unit. This is about the same price as one broadcast quality video camera for a conventional studio.

CONCLUSION

Distance education, using video tapes, can be one of the most effective way of teaching our growing masses of scholars. Once a good lesson has been produced it can be copied ad infinitum. There is no other system as flexible as video: It can be stopped, rewound, fast-forwarded, etc. It is a medium that is real - a student can watch a real live situation, take actual readings from a science experiment or compare his calculation to a line by line development of a problem on the screen. It is the most personal of all the electronic teaching aids bringing the presenter and each scholar together as a team.

The one-man studio produces outstanding material at a fraction of the cost of any of the alternative methods. It has now made distance education a reality and video the most cost-effective way to reach out to tomorrow's world.

FORMATIVE EVALUATION OF ETV PROGRAMMES

BY

ALIZA DUBY

SOUTH AFRICAN BROADCASTING CORPORATION

Paper submitted to the Distance Education Conference,
Pretoria, May 1987

FORMATIVE EVALUATION OF ETV PROGRAMMES

BY

ALIZA DUBY

C O N T E N T S

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FORMATIVE EVALUATION OF ETV PROGRAMMES

Aliza Duby

South African Broadcasting Corporation

Introduction

This paper attempts to explain the unique characteristics of each of ETV's development phases. It also suggests what kind of evaluation activities could and should be carried out parallel to these development activities and who should participate in the evaluation process. In addition, it explores the critetria for this evaluation.

The paper suggests employing the Self-Formative Evaluation approach (Duby, 1985). It follows that ETV developers and in-house evaluators working as evaluation-development teams using cognitive, affective and moral criteria improve the programme impact and the staff performance in one.

Figure 1 shows the distinguishable phases of the programme development.

Figure 1 : ETV developmental stage

ETV Phases of Development		ETV Stage of Development	
I.	Preparation	1. 2.	Idea Rationale
II.	Development	3. 4.	Content Script
III.	Production	5. 6.	Production of pilots Full-scale production

Theoretical Framework

Formative Evaluation

"Without a careful integration of formative evaluation activity, instructional development is nothing but an art form, an invention, usually with poor marks in aesthetics". (Nathenson, 1980, P.11)

Empirical reseach into the usefulness of formative evaluation studies was carried out by Abedor (1972), who defined formative programme evaluation as an attempt to answer three questions:

how to identify weak points in a programme using data collection;

how to analyse these data to develop revised hypotheses;

how to design and evaluate revisions.

Markele (1967) demonstrated the merits of trying materials in their draft stage with a single or a few learners using non-control-group design.

Cronbach (1963) emphasised the need to analyse the draft of an instructional programme, to provide the developers with evaluative evidence during the development process. His reason:

> "Evaluation used to improve the course while it is still fluid, contributes more to improvement of education than evaluation used to appraise a product already placed on the market". (Cronbach, 1963 : 675)

He also proposed to examine the effectiveness of segments of a programme rather than the "course as a whole" in order to identify "places where the course could be strengthened".

According to some researchers (Mann, 1969; Werner, 1980) expert judgement is conspicuously absent from evaluation reports. Nevertheless, the formative evaluation of "Sesame Street" and "3-2-1-contact" relied heavily on expert opinion (Cook and Curtin 1985; Palmer 1978). However, Cook and Curtin (1985) claimed that the adaptation of the CTW model by ES-TV was very poor partly because it did not include expert opinion.

Alkin (1974) focused on the testing of individual components of a programme as a typical formative evaluation activity. He added some more features of formative evaluation studies :

their design is explanatory and flexible; they emphasise interactive processes, make use of a variety of research instruments and do not use comparative

studies.

As summarised by Natenson (1980 P.28):

> "Formative interim evaluation provides feedback to the developer at the stage when he is working with pieces of a product which is not yet fully assembled. This may involve critical appraisal of the materials - by the developer himself and by his immediate colleagues and various outsiders such as specialists in instructional design, experts in the technical aspects of the medium through which the materials will be presented, and teachers who may be using the final materials".

Cook, Appleton, Conner, Shaffer, Tamkin & Weber (1975), dealing with the experimental formative evaluation of "Sesame Street" programmes, defined formative evaluation as being typically concerned with a low level of generalisability. They said generalisability was not as important in formative research as was the rate of feedback. Audience-oriented research is usually limited to groups of recipients with specific characteristics such as age, intelligence, interests, socio-economic background and other viewers' past experience (Sturm and Jöng, 1981) and is thus also characterised as nearly generalisable. Although they gather infromation from other relevant evaluation reports, the formative evaluator always has to conduct specific formative evaluation for a given programme in order to ensure the success of its unique objectives and nuances.

Formative Research has much in common with formative evaluation and is usually applied in the context of developing ETV (Nathenson, 1980), but is excluded from this study because it adds to formative evaluation the dimension of formulating the generalisability of hypothesis, whereas this study concentrates on pragmatic and practical evaluation. Formative research is also conducted solely by the researcher whereas formative evaluation emphasises in-house team work. The main purpose of formative research is to collect data systematically from audience tests in order to evaluate progress towards the achievement of objectives that have been clearly identified in advance (Palmer, 1974), whereas this paper suggests that objectives that emerge during the ETV development should also be considered.

Pilot Programmes

Another type of formative evaluation is the try-out study. This is the testing of a short programme or segments of programmes on a sample of the target audience. This process is widely used among ETV production companies and is mentioned by many researchers such as Baggaley and Duck (1976), Land (1972), Lesser (1974), Mates (1980), Nickerson (1979), Palmer (1978) and Tidhar (1979).

It is worth pointing out that although the test studies brought the CTW success, some production houses failed to implement the CTW model. This was because their investigation focused on pilot programme test studies rather than on the continuation and re-iteration of formative evaluation activities during the development stages of one programme (Cook and Curtin, 1985).
The CTW model is shown in figure 2.

Figure 2 : Formative Evaluation - The CTW Model

Formative Evaluation Activities

1. Pre-Production Phase

   1.1. Experts conduct needs analysis and hammer out detailed behavioural objectives linked to the founder's definition of the educational problem to tackle.

   1.2. Executive producer and experts agree on behavioural objectives.

   1.3. Producers and other production staff are hired for their proved creative skills and their willingness to work with researchers.

   1.4. Researchers and experts develop production philosophy and format.

2. Preliminary Production

   2.1. Internal researchers conduct formative evaluation (laboratory style) on comprehensibility and appeal of segments to viewer population and modification of segments.

   2.2. Pilot show (one or more) is produced to estimate the audience appeal and comprehensibility (interview, questionnaire, mechanical) and to select best pilot programme and best features.

   2.3. Discussing the findings : informal, supportive, teamwork.

3. Production

   3.1. Full-scale production, which receives permanent feedback from researchers and experts.

Cook and Curtin (1985) summarise five reasons for the success of the CTW model:

a. The funding of long pre-broadcast periods in which "needs analysis is conducted, objectives are made explicit, initial plans are critiqued, and pilots are produced, tested and modified". (P.95)

b. The establishment of co-operative teams in which producers pay close attention to formative researchers and subject experts and use their advice when making programme decisions.

c. Producers continue to pay attention to formative evaluation feedback during the full production phase.

d. "Formative researchers and content experts are useful so that, without them, the pedagogic or artistic quality of production would be less." (p. 95)

e. The fifth assumption deals with the guarantee of high quality and the acceptance by the target audience of pilot programmes produced with formative evaluation.

Two innovative features of formative activities used in the CTW model should be emphasised:-

a. re-iterative formative evaluation feedback;
b. continuity of in-house staff involvement in the formative evaluation/ development process.

The two features not only contribute to the immediate and continual improvement of the product, but also to the immediate and continual improvement of of the staff involved.

Learner Verification And Revision

Learner Verification and Revision imply that the learning effectiveness of a programme will be improved if it is taken through a cycle of try-outs with a sample of the target audience, by revision based on the feedback (Nathenson, 1980). It thus does not include all formative evaluation activities (as defined by Scriven, 1967); it is actually included in the "try-out" activities and also carried out summatively (but formatively oriented), as long as the programme has "market life" (Komoski, 1974). Some researchers proved in their intensive, imperical television research (Groppen and Lumsdaine, 1966, and Fleming, 1963), that in cases of revised television programmes based on try-out studies the performance level of viewers was raised by 20 - 30% over the original.

Later researchers (e.g. Nathenson, 1980; Baker, 1970) argue with these results since the abovementioned researchers tested the original against the revised versions. By doing that they did not prove that revised programmes based on try-outs improve programmes more than revised programmes based on, for example, the producer's intuition.

Self Formative Evaluation

Self-formative evaluation of instructional media during their development can be carried out in addition to the internal evaluation (Lewy, 1985 b) by users or developers of the programme jointly (Duby, 1985 b).

It is not to be confused with Self-Evaluation which has a phychotherapeutic contingent. It is also different from evaluation conducted by an outside researcher.

Abedor (1972) proved that the quality of a developer's work gradually improved after his work was submitted to formative evaluation. Abedor also showed that after a learning period during which three or four units from a particular developer were scrutinised and revised, the developer reached a level where only small revisions of the drafts were needed.

The aspect of the Self-Formarive Evaluation is that "television producers do not generally seem to involve themselves directly in evaluation activities". (Nathenson, 1980, p. 29)

Closer contact between developers and evaluators and the possibility of simultaneous planning of development and evaluation activities and the self improvement effect are the main features of self-formative evaluation (Duby, 1985 b).

The advantages of using self-evaluation in the formative evaluation of ETV are summarised here by Duby (1985 b):

a. Self-evaluation reduces the threat associated with the activities of an external evaluator.

b. An individual who has carried out self-evaluation activities tends to show openness to evaluation carried out by others.

c. Self-evaluation increases awareness of the benefits that may be gained by the evaluation.

d. The party carrying out the self-evaluation has first-hand knowledge of the actual evaluation needs and is familiar with the context variable, which may effect the validity of the findings.

e. Self-evaluation carried out jointly by developers and users strengthens communication between them.

f. Self-evaluation is a powerful tool for self-improvement.

g. The producer, who also functions as an evaluator, is constantly informed about the evaluation results and is able to make decisions to improve the programme.

h. The user himself is involved in the evaluation and is therefore better motivated to play an active role in producing educational TV programmes.

i. Information obtained from "formative evaluation" is assimilated into the production process quickly.

j. The involvement of the ETVP developer and ETVP user in the production ensures the maximum suitability of the programme to fulfil its intended purpose.

k. An ETVP evaluated in its early stages will cost less and will be produced faster than an ETVP evaluated in later stages of production.

It will be of interest to compare programmes based on Learner Verification and Revision to programmes based on Self-Formative Evaluation and Revision.

Needs Assessment

Kaufman and English (1979) define need as a gap between current outputs or outcomes and desired outputs or outcomes. The needs assessment process is to determine the gaps between the existing and the desired and to put them in priority order.

Cook & Curin (1985) summarise needs assessment research as the attempt to determine:-

- what the target audience should understand to master the content of a certain programme;

- what needs have already been met;

- the discrepancies between the desired targets and actual conditions.

Scriven (1981) alerts the researcher to the confusion between necessary needs and desired ideals, although: "True needs are considerably harder to establish than felt wants, because true needs are often unknown to those who have them - possibly even contrary to what they want". (p. 101) Thus, he suggests, "drop the use of ideal level as the key level in the definition of need" (p. 102), instead using the necessary level. Necessary needs are facts that need to be fulfilled for a certain target audience, in order to avoid bad results, putting aside what they want or what they think they need. He also points out that the needs should be determined in terms of performance needs and not by treatment needs.

It follows that the role of the ETV formative evaluator, as early as the planning stage, is to identify the assessed needs and to examine the feasability of fulfilling them by producing a suitable TV programme. In order to reach the target audience it is the evaluator's task to identify the treatment that will enhance achievement, eg. by matching ETV programme's content with the target audience needs.

The results of needs assessment can be used later in the formative evaluation process when "reference criteria" emerge. The evaluator can measure the

the beneficial quality of such objectives using the assessed needs as a yardstick.

Content Analysis

Content analysis is defined by Scriven (1981) as "the evaluative or pre-evaluative process of systematically determining the characteristics of a body of materials". (p.31)

The techniques for this evaluation process are mainly : counting frequency of certain kinds of words; analysing the plot in order to determine balanced appearance of certain images, e.g. males, females, children, robots, blacks or whites etc; monitoring reinforced main ideas or main objectives against side issues, etc.

Its main use is to ensure that the right learning effects (pay-offs) accrue as a result of exposure to the right amount of selected effects. Thus content analysis can result in content validity which indicates whether the content appears to meet all requirements for congruence between claimed and actual content, only claimed requirements and/or meets unclaimed objectives.

For example, a TV programme teaching basic scientific concepts was planned, aimed at pre-school children ("Ziki Zikombot", 1985, M Landers, Manager). Research taught us that in order to influence the retaining of concepts by this target audience it was advisable to repeat the message by verbal or visual techniques. (Rydin, 1973) The evaluator counted how many times each of the main concepts appeared in the script. It was found that the 'round shape' and 'the sun is made of fire' were repeated verbally in the script and that the 'round shape' was reinforced again by visuals in the pilot programme. 'What the moon is made of' was not repeated. The post viewing data revealed that the children knew what was 'round' and 'what the sun is made of' but could not remember 'what the moon is made of'.

Criteria For ETV Evaluation

Educational Criteria Sources

Scriven (1974) suggests that for each educational project a "Production Evaluation Checklist" (p. 7) should be compiled.

The status of every item in that checklist can be expressed by saying that each is "desiratum" and some items are "necessitata" ... "Each of these conditions must be met to have impeccable ground for a conclusion of merit for an educational programme". (p.8)

Formalisation of educational objectives does not occur in vacuo, disconnected from reality, but is a result of socio-cultural-economic factors and should reflect the values and principles of a given society (Postlethwaite, 1977).

Tyler (1950) was the first to establish a framework for the compilation of this "checklist".

Tyler mentions three sources for educational criteria:

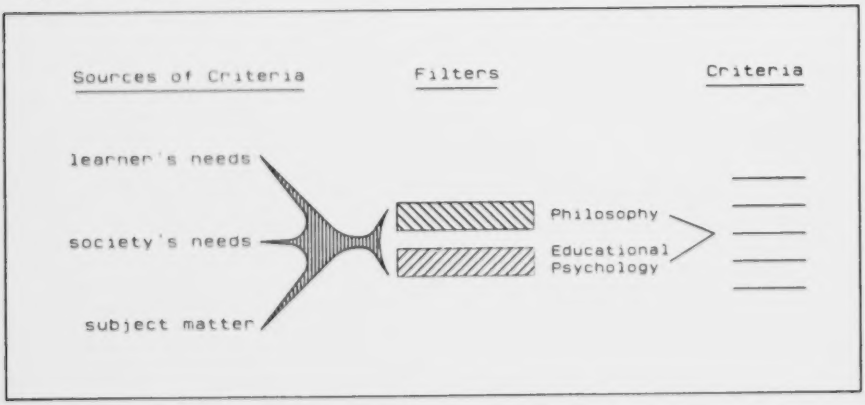
the society;

the learner's needs;

the subject matter.

He says there are two filters for the final selection of objectives: philosophy and education psychology (Tyler 1950). Tyler's model can be schematically represented as follows:

Figure 3: Tyler's Model



Many researchers oppose Tyler's approach. Eisner (1979) for example, gives reasons against pre-specification of objects for curriculum planning:

- The teaching process is dynamic and complicated and results in a variety of outputs that are difficult to predict and therefore impossible to prescribe as objectives.
- A desired action or determined content may be the basis for an educational programme and not necessarily a final determined objective.

Domingo (1979) said that one must be aware that the determined objectives do not contain all that can be achieved by the learner using that programme.

In stating this, they formulated the fundamentals for those who believed in the freedom of the educationalist to act spontaneously and not be imprisoned by predetermined educational objectives.

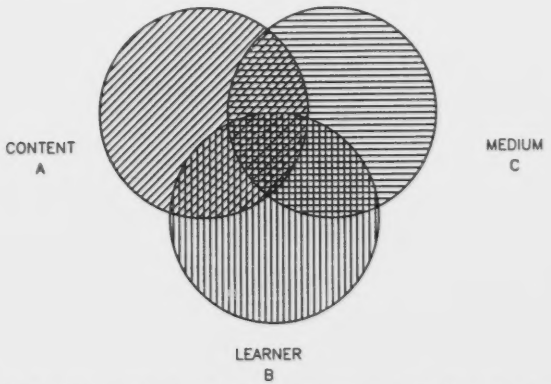
Mager (1975) and Scriven (1974) enriched the criteria for the evaluation of an educational product by suggesting an additional approach for the selection of the criteria, which Mager (1985) termed as "reference criteria" and Scriven (1974) as "goal-free evaluation".

"In this approach, the evaluator would make a deliberate attempt not to be co-opted by the rhetoric of programme goals". (Scriven, 1974, p. 179) Accordingly the evaluator uses the evaluation subject as source of criteria, regardless of the stated goals. He identifies issues that exist in the educational needs ("or producing educational or personal harm") (p. 179).

Consequently it is the evaluator's role to rephrase the objectives as they occur. In our model the last stage at which objectives can still be changed is the stage labelled "content". New objectives arising in the script stage should be identified, phrased and examined. However, they should be limited in amount or avoided to prevent an endless development process.

Three elements are joined to create an instructional TV situation (Duby, 1985 b): the content, TV features and viewer characteristics. The three components are presented in figure 4.

Figure 4: Overlap model of three components.



Criteria for the analysis of ETV programme will therefore stem from the three zones. The "learner" component is further divided into cognitive and affective factors (Bloom, 1976) and also concerns the unique needs of particular learner groups (Guillford, 1959).

The criteria for evaluating the content refer also to two behavioural domains: the cognitive and the affective.

Criteria for evaluating the medium stem from the same two domains as well as from the unique qualities of TV.

Cognitive Criteria

Cognitive criteria are clustered by Taba & Hills (1965) in two groups: lower mental functions and higher mental functions. Low mental activities include knowledge of information and the recall of information.

Bloom (1956) divides mental function of high order into five categories in the following hierarchy: comprehension of the message; application of the message to solve problems; analysis of the message in order to identify its components and the relationships between them; synthesis of the analysed components to create something new based on these components; and evaluation of the message according to standards.

Cognitive criteria from another point of view may be drawn from Piaget's theory (Piaget 1952, 1957). He says that the first thinking skills born in the human mind are elements of concrete thinking.

One can refer to concrete thinking manipulation abilities in 2 to 5 year old children. The concrete thinking gradually develops into abstract thinking (the way adults think) via generalisation of concrete elements in 6 to 9 year old

children.

Sturm and Jöng (1981) researched the information processing ability of 5 to 7 year olds reacting to verbal and pictorial stimulus of a TV programme and found that indeed in this 'intuitive stage' (Piaget term), visualisation of verbal information is more effective than merely verbal information, and visual information accompanied by verbal information is more effective than merely visual information. And detailed commentary is more effective than simple commentary. This indicates that to achieve more effect on the children's comprehension, more commentary is required in ETV for this age group than for older children; commentary that will provide narrations not only for those aspects of the programme that are not directly self-evident from the pictorial material.

They also found some differences between the 5, 6 and 7 year olds.

The 6 and 7 year-old children are more able to form appropriate images from what they hear, than the 5 year olds who need more verbal reinforcement of verbal information. "The younger children rely more on verbal cues which direct their attention". (This addition does not interfere with the comprehension of visually depicted events by the older children.)

They also found that format of presentation is supposed to be "consistent with the criteria which characterise the stage of intuitive thought" (p.61), i.e. in an orderly sequence.

If the cognitive capacity of this age group is taken into account, this age group (5 - 7) is able to comprehend even relatively long programmes.

Simultaneous analysis of the ETVP potential and of target audience abilities will provide the researcher with data concerning the programme's cognitive suitability for a certain audience. For example, the concrete-abstract elements in the programme should be analysed and matched with the viewer's ability. This is why one can produce a TV programme aimed at pre-school children, who may find a book too abstract a learning instrument (Minowich 1966).

Affective Criteria

The power of TV as an instructional medium lies in its ability to influence viewers' attitudes. Criteria from that field should thus be employed in evaluating whether the ETVP consists of such values and whether they match the objectives of the instructor.

Bloom (1976) identified five categories in the affective domain in the following hierarchy:

receiving (attending and reacting);
responding (active);
valuing - commitment to certain values and sustained interest;
organising - looking for a conceptual explanation.

Medium Criteria

Although TV production is a technically complicated process (Creaser 1981; McNaught 1979; Stephen 1975) it is very easy for the viewer to explore.

Wasche (1966) suggests a technical criterion:

- What knowledge is needed about technical aspects of TV and TV equipment to be able to use the TV as an instructional tool?

Since the technical characteristics of a programme or its format influence the understanding of the individual viewer, they should be watched and be evaluated (Baggaley 1980, Burke et al, 1981; Paluzzi, 1980)

Aversa and Forman (1978) describe the UMA model that is based on three categories of criteria, namely content, design and aesthetic quality".

Content Criteria, such as:

Is the content important?
Are there content errors?
Are there ambiguous content areas?
Is there an appropriate amount of content?
Does the programme present interesting and challenging ideas?

Design Criteria, such as:

Is the programme well organised?
Is the information clearly presented in the programme?
Are too many or only few topics treated?
Does the programme develop the main points adequately?
Are the main points well visualised?

Production Criteria, such as:

Is the voice-over technique used effectively?
Are existing stills and footage put to good use?
Is there continuity between sequences?
Are the sequences in appropriate length?

Coldevin (1975, 1976) sub-divides the production criteria to:

Technical variables, i.e.:

camera angle, close-ups, setting, lighting effects, sound effects, selection of colours, etc. To these Burke; Dowalibly and McKee (1981) add editing techniques such as cuts, linking shots, sequencing of shots, etc.

Format, i.e.:

opening or closing, packing (does the target audience see it as too fast, too slow, or correct) (Baggaley, 1980), built-in repetitions (Rydin, 1973). Burke et al (1981) suggest criteria such as the relation between verbal and visual density of information, and whether the educational message is salient.

Performing variations, i.e.:

performer's age, sex, eye contact level, etc.

Salomon differentiates "between the factors according to their effect on learning: the technology involved, the content transmitted and the symbolic codes in which the message is coded". (1976:25) He conceptualised TV as having its own symbolic codes and says that "It is the code into which TV is coded that makes the largest and most important difference in learning". (p. 26)

The learner must therefore familiarise himself with these TV codes in order to "translate" the message transmitted into a meaningful cognitive message. The

knowledge acquired from each use of a different code is different in amount and content. He found, for example, "that children viewing the version which emphasised close-ups acquired more knowledge pertaining to the relationship between parts or wholes". (p. 26)

The close-up technique can develop cognitive skills of analysing and differentiation in the viewer. It can also be used for emphasis.

One should therefore test an educational programme on issues such as : does the close-up emphasise an important element (from the educational point of view) or does it distract the viewer's attention to a side issue? If the differentiation between two elements is the educational objective of a programme, is the close-up used to help the viewer distinguish between the two?.

Salomon found that "children viewing the version which entailed logical gaps excelled in their comprehension of the plot's logical structure and continuity". (1976:26) Such planned and unplanned gaps can serve as educational criteria as well. Other similar criteria include the use of humour in the programme, drama effects, use of colour (Clements, 1984) etc.

"One of TV's major advantages is its capacity to overtly and explicitly show a process, a transformation ..... TV alone can visually show a transformation which is analogous, or ever similar, to what ought to take place in our minds". (Salomon 1976) The evaluator can therefore examine whether the programme is about a process or a static situation and can conclude accordingly what to show in the TV programme and what to leave for books and other static aids.

Lesser (1977) and Cook and Curtin (1985) pointed out that the "Sesame Street" programmes, which imitated the pace of American TV advertisements, probably caused hyperactivity, short attention spans and lack of interest in later slower-pace class activities in young viewers. This crucial statement was heavily criticised (Anderson, 1985). Still, the pace of a programme can be tested with target audiences to establish acceptability and popularity, but a criterion has not yet been established to say what pace a TV programme should have.

Who Should Be Involved in the Formative Evaluation Process

In House-Staff

The more members of in-house production staff are involved in the evaluation process, the more they reveal openness to evaluative recommendation, and the more they are capable of improving their own professional expertise and understanding and applying better evaluation results (Duby, 1985 b).

In researching the feasibility of carrying out self-formative evaluation at the SABC (Duby. 1985b), the willingness and ability of in-house staff (production team and internal researchers) to carry out evaluation activities was tested.

The subjects included three types of specialists : TV managers, producers and internal researchers. The collected data revealed that approximately 85% of the respondents showed a positive attitude towards formative evaluation.

Answers to the question "Who should be involved in the evaluation process?" are presented in the following table.

PERSONS TO BE INVOLVED	RESPONDENTS			
	MANAGERS (n=3)	PRODUCERS (n=4)	RESEARCHERS (n=5)	TOTAL (n=12)
1. Manager	3	2	1	6
2. Producer	2	4	4	10
3. Internal Researcher	3	4	5	12
4. External Evaluator	3	0	0	3
5. Subject Matter Expert	3	3	1	7
6. Educator (Expert)	2	3	1	6
7. Psychologist (Expert)	1	0	1	2
8. Educational Practitioners	2	1	4	7
9. Target Audience Reps.	2	2	4	8
Maximum = n x 9	27	36	45	108
TOTAL	78%	53%	47%	

Table 1: Response to the question on people who should be involved in Evaluation (Duby, 1985 b)

The interpretation of the table is as follows:

a) Each group of professionals is inclined to emphasise its own role in the process of evaluation, i.e. all managers delegate themselves the evaluator's role while only 50% of the producers and 20% of the researchers delegate this role to managers.

b) Managers unanimously indicate willingness to co-operate with internal re-seachers, internal evaluators, external evaluators and subject experts. The producers grant such credit unanimously only to internal researchers, while their openness to external experts is partial.

c) The researchers are even more "self-oriented". At the same time researchers value the target audience's appreciation of a programme and educational practitioners' opinion, more than the production team does.

d) Managers (78%) are more willing to involve professionals of other specialisations in the evaluation of their programmes than producers (53%) and researchers (47%).

In the same study the TV professional's ability to conduct self-formative evaluation of TV programmes was examined.

They were asked the evaluate the content of the programme and the use of the qualities, to analyse the target audience and to evaluate the suitability of the programme to audience needs. The subjects evaluated the script before and after viewing the TV programme.

The data revealed that the TV professionals made meaningful judgement on the content of the script and to a minimum extent on the use of the medium.

They lacked self-confidence when dealing with learner characteristics and did not recognise the importance of concepts derived from educational psychology.

Nevertheless, by being involved in empirical studies, the producer had direct contact with his target audience, and also become more research-oriented and thus more open to criticism and self-improvement.

Teachers

Teachers are potential users of ETV, and because they know about the learner's needs, capabilities and attitude towards learning issues, they could be involved in the formative evaluation of scripts.

It was reported (Duby, 1985b) that teachers (pre-school and high-school teachers were tested) made a valid contribution to evaluating the content of the script. The collected data clearly indicated that the teachers felt comfortable making statements about the educational aspects of content and had a high level of self-confidence using terms derived from educational psychology (e.g. pre-requisite and taxonomic categories of educational objectives). They also showed competence in evaluating the match between learner characteristics and programme content but were less effective making evaluative comments about media characteristics and their match to the content.

Experts

As indicated previously managers, producers and researchers had different ideas about who should be involved in the evaluation process.

To create a valuable comprehensive and accurate programme, experts from other areas not yet discussed should be called in for advice during the production. These should include psychologists, educationalists, socialogists, experts in the relevant subject matter, technical experts in relevant inter-disciplinary fields, etc. (Cronbach, 1963; Leide, 1977; Lewy, 1973).

Nevo (1985) systematised the implementation of the "expert's tool" in the evaluation process and, by applying the system in formative evaluation research, demonstrated that the synthesised experts' opinion was perceived by the evaluation clients as very relevant information.

Nevo (1985) consigns two functions to the in-house researcher in this regard : to synthesise the expert's input and to sample the external experts to be invited to participate in the evaluation project.

Selection of experts should be based on their known academic and practical expertise. Their expertise should not stem from their formal qualification only; they should also be knwon for their credibility.

The advantages of expert input as an evaluation tool are summarised here :

- Expert contribution broadens the scope of the kind of information collected on each evaluation programme (Nevo, 1985).
- Expert opinion in the production stage gives one an extra constructional tool of evaluation (Duby, 1985a).
- It is an educational programme and its makers therefore cannot afford to expose its audience to mistakes. Experts can prevent mistakes (Duby, 1985 a).
- It is cheaper in terms of time and labour to employ experts than it is to try out a pilot or a final programme (Duby, 1985 a).
- Expert evaluation can help to detect problems in the early stage of

programme development (Lewy, 1973; Nevo, 1985).

- In the very early stages of production there is almost no other reliable method of evaluation.
- At early stages of programme development producers are still open-minded to criticism, but at later stages they are more concerned to justify what they have produced (Lewy, 1973).
- It is easier to manipulate the time schedule of experts than of an audience for experiments, observations and tests (Lewy, 1973).

The ETV Formative Evaluation Process

When only the idea of an ETV exists, one can examine whether there is a need for such a programme : Has the subject not already been covered by other teaching aids? Does the programme focus on the needs of a defined target group? What is the best presentation format (broadcasting, video cassettes, drama documentary etc) to produce this content for that audience?

Experts can refine the definition of the target audience and can provide data about its particular needs and abilities. The goals of the programme should be defined at this stage.

An analysis of cost effectiveness should also be conducted during the early stages of development. The prupose of this analysis is to determine the programme costs (which affect its potential effectiveness).

As a result of adequate needs-assessment research, cost analysis and expert advice, a rationale for the programme should be written. The evaluator has to see that the programme objectives are defined in the rationale.

Based on the rationale, the manager contracts the programme content writer. Experts on the subject are invited to provide information concerning content, educational objectives and their order of importance.

Subject experts continually provide the producers with advice and judgemental input about the scientific accuracy of the programme content. Educational specialists can also advise on the ability of the target audience to accept, absorb or use the ETV message.

In the 'content' and 'script' stages evaluators can test the documents and match the written script with the rationale and with the content, to ensure that scientific and behavioural objectives are treated and oriented correctly.

In the 'script' stage, criteria affiliated with the three sources (mentioned in figure 4) are already used, such as: suitability of the programme format to content, potential of the medium to fulfill the subject requirements, and suitability of a programme to target audience needs.

At this stage the evaluation team can be expanded. Duby (1985 b, c) showed that it is possible to collect valid and credible data regarding programme comprehension and acceptability from potential programme users such as teachers and TV professionals.

Production issues can be examined with viewers, only when a video cassette is available for viewing (Baggaley and Duck 1976; Van Vuuren, 1985; Cook and Curtin, 1985; Cook et al, 1975).

For this reason ETV production houses usually produce pilot segments or pilot programmes for previewing and formative evaluating (Baggaley et al., 1976; Cook and Curtin 1985; Cook et al., Tidhar, 1979).

For example: a pilot programme for the series "Ziki Zikombot", which attempted to teach 5½ to 7-year-olds basic mathematical concepts, was produced by the SABC ERTV. The producers thought that in addition to their target group they had an opportunity to capture other viewers and significantly increase the number of viewers. The pilot programme was therefore tested with a variety of potential viewers (Duby, 1985 c).

The study aimed to examine some production issues to ensure that the programme's salient points were not sacrificed by expanding the target age group. The pilot programme was therefore tested with a variety of potential viewers.

The oldest group (6 to 7) showed a great interest in the "real" material (EBE material) which was not attractive to the other groups. Although the group of 6 to 7 year-olds did not pay much attention to the "logo", the three younger groups were very interested and carried on watching the screen for as long as the "logo" was shown.

The data revealed that the programme was attractive and entertaining to children aged 3 to 7. The sets, acting, sound and visual effects were very well accepted by the 3 to 5-year-olds. The professor, scientific visuals and verbal information were well accepted by those aged 5 to 7.

The research conclusion was that it would probably be more effective for both teaching and entertaining to narrow the target audience to one age group (Duby, 1985 c).

Editing techniques are also the subject of formative evaluation in the later stages of the ETV development. In the abovementioned study for example, concepts that were emphasised in the ETV through verbal repetition and visual reinforcement were remembered by children after viewing, while the concepts that did not receive visual or verbal support were not remembered by the viewers.

The results reinforce the conclusion that by intentionally identifying concepts and deliberately repeating them with visuals and sound, it is possible to promote the viewer's comprehension and retention of educational elements. (Rydin, 1973).

The fact that the introduction of changes or corrections to material on video tape costs much more than correction on paper, leads on to conclude that the earlier the change is made, the cheaper it is.

As already discussed, in the early stages of producing a TV programme, paper work, brainstorm sessions and discussions take place. Because many people are

involved in the formative evaluation activities in these stages they are time-consuming, but are relatively inexpensive processes. One can spend up to 70% of the total development time on preparation activities whereas only 30% of the time is spent on real production. It was calculated that from one hundred percent (100%) of a budget allocated to the production of a programme, a maximum of 30% is spent on the first two stages. This includes experts' fees, script writing, correction of content and correction of script. Once the real production begins, the amount of money spent per stage increases and is used, for example, on the set, the shooting of the recording and tape editing (70% of the budget). Although the production stage is short, in this stage, time becomes a money factor as well, because the equipment, the set, television professionals and such are expensive resources that are paid for according to time, adding to the cost of these already expensive elements.

If the two measurements of time and money are combined, it is obvious that the earlier the production stage, the more time is available for evaluation examinations and the less money is spent on such rectifications.

In summary, when intensive and reiterative formative evaluation takes place in early production stages, the testing of preliminary TV programme segments and/or the testing of the pilot show can be limited mainly to production issues : presentation, setting, sound, acceptability of characters and editing techniques. But the rationale of the programme, its content, objectives, validity, suitability, accuracy and educational contribution should be researched in the early stages.

A model that presents the Formative Evaluation Activities in the ETVP development is shown in figure 5.

Figure 5 : ETV Formative Evaluation Activities.

ETV Stage	F.E. Activities
Idea	needs assessment coverage of subject defining goals defining the target audience selecting the format cost analysis cost effectiveness
Rationale	refining the target audience collecting experts advice defining objectives
Content	refining objectives putting objectives in order of importance content analysis comparison with rationale refining objectives definition (reference criteria) collecting input from experts
Script	interpreting experts' input (accuracy, acceptability, suitability) matching with 'content' and 'rationale' analysing TV technicalities matching content, medium and target audience collecting educationalists-users' advice
Pilot programmes	testing production issues and acceptability with viewers

Conclusions

As can be seen, the criteria become subjective and flexible measurements that are, in the case of the evaluation of television, extremely dependent on the technical ability of the producer.

The evaluator's technical understanding is such that he is able to relate an educational outcome to a technical quality.

We hope that Formative Evaluation, which considers moral scientific and social values as its criteria and which is conducted by its own staff, will increase the quality of the ETVP as well as its impact on its target audience.

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DISTANCE EDUCATION FOR SOUTH AFRICAN ADULT LEARNERS: THE ROLE OF EDUCATIONAL TECHNOLOGY

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INTRODUCTION

Much has been written and said about the many problems in South African education which are having a profound social, political and economic effect on the country. In essence, the trouble is that for far too long, relatively small numbers of black people have been moving through the schools to tertiary institutions and the work place.

In recent years, a great deal of work has been done in black education to redress the situation and many outside bodies have been pressed into service to assist. People leave school early but often still wish to study. Given the over-riding importance of paper qualifications and especially the matric exam, many have to study. For such, there remain alternatives for a second chance and this paper considers three possibilities for people who have to study part-time:

- Adult education
- Distance learning
- Educational technology

As will become clear, all three overlap and could, in fact, form one concept: the use of technology for the education of adults at a distance.

A popular belief is represented by the saying that one can't teach an old dog new tricks. Kidd's view (1973, p20) is that such opinions are "perversion and misrepresentation" of psychological research. He argues there are two main limits to human growth and development:

> The real practical limit to one's maximum ability or potential capacity, and the no less real psychological limit which each man places on himself. Unfortunately, the chains that bind us most severely are those which we fashion for ourselves. (Kidd 1973, p17. Italics in original)

Nevertheless, for many years, education was provided with children in mind and if an adult wanted to learn, he or she simply had to take what was on offer (Kidd 1973, p37). This had a decidedly negative effect on many adult learners. As Knowles (1980, p45) points out, adults are:

> ...producers, doers - workers, spouses, parents...who have status in their own eyes and those of others...They have a deep psychological need to be seen by others as self-directing.

Adults, therefore, require special treatment. However, they are often so conditioned by their experiences at school that they expect to be passive recipients of subject content imparted by a teacher. This presents adult educators with a special problem (Knowles 1984, p9) if they take the attitude at face value and treat the learner as a dependant personality. If this happens, a conflict is set up between the adult's preconditioned intellectual model of how a learner ought to behave and his much deeper psychological need to be self-directing.

It is argued that in South African black education, stress on rote learning in many schools combines with perceptions of racial

self-image to exacerbate this issue - the more so if the teachers happen to be white.

A further barrier to learning is that many adults associate learning with disrespect, failure and anxiety (Knowles 1980, p46; Darkenwald and Merriam 1982, p78; Kidd 1973, p35; Szczypkowski 1980, p43; Lanese 1983, p16). It is thus essential to ensure that the physical, psychological and learning environment should be acceptable to adults.

Negative influences may also be conveyed to learners by teachers who, for a variety of reasons, are biased against adults. Some feel adults are inadequate learners while others may feel uncomfortable teaching people who are older than themselves.

Andragogy

Because of his feelings of disquiet about then current methods of teaching adults, Knowles (1980; 1984) formulated a system called andragogy - a name being used in Europe at the time (Knowles 1984, p6) - which means the art and science of **helping adults to learn.** This contrasts with pedagogy which is the art and science of **teaching children** (Knowles 1980, p40).

Under the influence of andragogy, the task of the teacher changes to that of facilitator of learning. He/she becomes a resource person - a catalyst, who responds to the needs of the students. The job becomes that of helping people to learn, rather than actually teaching. This can be disconcerting at first for teacher and learner but according to Knowles, once "adults discover that they can take responsibility for their own learning, they enter learning with a deep ego involvement with results that are both startling to themselves and to their egos." (Knowles 1980, p46).

Criticism of andragogy

According to some critics, the pedagogy-andragogy division would be better addressed as teacher-directed or self-directed, instead of focussing on teaching of children versus teaching of adults.

Part of the andragogy debate may be seen to centre around differences in adult educators' philosophical orientation. McKenzie (1977, pp225-7) explains this as the difference between those who believe adults and children are essentially the same and therefore should have the same education, and those who believe adults and children are existentially different and should therefore have education which is existentially different.

AIMS AND PHILOSOPHY IN ADULT EDUCATION

Three concepts identified by Darkenwald and Merriam (1982) seem to have a special bearing on South African adult education.

Adult education for individual self-actualization

Individual self-actualization is one of the mainstreams of current adult educational thinking (Darkenwald and Merriam (1982, pp46 et seq).

The overall goal of education according to Maslow (1976, p120) is "helping the person to become the best that he is able to become". The focus on individual growth and development influences the curriculum, lesson content and the roles of teacher and learner in adult education. The student becomes the centre of the educational experience, while the teacher assumes the role of a facilitator or partner in the learning process. Individual freedom and responsibility are all important and the

teaching of actual content takes on less value.

While group activity is cited as the preferred instructional technique, Rogers (1969) tells us other activities are also used: "student contracts, simulation games, and even programmed instruction, especially that which addresses affective as well as cognitive dimensions."

Knowles acknowledges that computer-based education has much to offer in adult learning. His (1984, pp81-5) book has a section by Green in which she expounds on the suitability of computer-based learning for adult learning (p83). But a year earlier, Knowles himself had already conceded: "I perceive the computer to be the most potent tool for adult learning to appear in modern history" (Knowles 1983).

Adult education for personal and social improvement

This philosophy (Darkenwald and Merriam 1982, pp 50 et seq) emphasises the role of the individual within the social context with the goal of improving society by improving the lot of the individual.

Lindemann (1961) asserts that adult education should aim improve the individual's life in society and contribute to social action. This opinion has potentially far-reaching effects on society, especially in South Africa. "Every social action group," he writes, "should also be an adult education group, and all successful adult education groups sooner or later become social action groups."

The teaching methods favoured include problem solving, project methods, and the activity method. The teacher is responsible for organising, stimulating and inspiring the learner in a relationship of partnership. He is no longer "the oracle...but

rather the guide." (Lindemann 1961). This is similar to the teacher's role described in the previous section but with a slightly more active partnership with the learner.

The relationship encourages the provision of resource material, and computer-based education could form an important and very useful resource, especially as the learner is able to use it on an individualised basis, referring to the teacher only when necessary.

Adult education for social transformation

The radical educators such as Freire (1972) and Illich (1971) emphasise the central importance of education in bringing about a new social order. This involves, among other things, criticising the existing social order and presenting a vision of a better society (Darkenwald and Merriam 1982, pp58 et seq).

McGinnis (1981, pp24-5) believes the focus of adult education must be human liberation - "a process of man's continuous efforts to create a society in which all people feel themselves to be and are in fact, free from all forms of oppression."

Illich (1971) develops the point in asserting that most learning is acquired incidentally, through life experience rather than school teaching. Learning could also be gained by other means: one could approach a master or a peer, study from books or use "other learning instruments" - which could include computers. Further services for adult and child learners in Illich's "deschooled" society are networks to provide reference services in the form of books, radios, microscopes and other equipment; skills exchanges; reference services for educators and peer matching.

Liberating education is a fruit of the joint efforts of students

and teachers, who work together to formulate curricula and who learn and teach simultaneously. Adult education is crucial in Freire's (1972) writing: many adults have been subjugated by the oppressors and they have to be liberated through adult education.

Freire is very aware of the political implications of education, both as practised by oppressors and as designed for liberation. In the right hands, it could be as powerful a force for freedom as it is for subjugation. Technology too, as Forsythe (1983, p161) reminds us, is a mighty political force for social action.

Notwithstanding the vigour of the radical argument, Darkenwald and Merriam (1982, p64) assert that few educators advocate anarchistic social transformation as the aim of adult education. In South Africa, however, this is probably less valid, given the central place of education in the black struggle against apartheid. There are almost certainly parallels between Freire's liberating education and the calls for "people's education" which are increasingly heard in South African townships in 1986.

DISTANCE LEARNING

There are many here more competent than I to define distance education. For this paper, I favour the definition quoted by Gough (1984, p18) which describes it as:

> a mode of teaching and learning which, for the most part, allows the student to choose the time, place and circumstances of learning. It requires the design, production and delivery of self-instructional materials and the provision for student access to educational resources designed to support independent study.

If adult learning is important in its various forms in the South African context, distance learning - especially in the light of this definition - is no less so. A glance at the list of institutions represented at this conference shows the variety of

organisations involved in distance learning, covering academic, commercial and technical instruction, from school to tertiary level.

The extent of the need for distance learning may be seen in higher education where UNISA is far and away the largest university in Southern Africa and provides a service for learners all over the world. Technical education is provided by Technikon RSA and there are dozens of correspondence colleges catering for a multitude of subjects. In some places, lack of a local learning institution forces students to study by correspondence.

Apart from South Africa, a vast body of information is being built up on distance learning in countries such as Australia, which has been in the business for decades and Canada - both countries where the wide open spaces really are. To get some idea of the variety of settings in which distance learning can be applied, the University of the South Pacific (Williams 1984, pp45-53) caters for students in 11 countries covering more than 3000 square miles of ocean. In contrast, the British Open University has done much to focus attention on distance learning in that much smaller country, although serving a much larger population.

Anyone who has ever experienced distance learning knows how soul destroying it can be. The quality of learning is affected by the student's relative isolation from others and it is interesting to note that some UNISA courses insist that students attend study school or study groups. A great deal of work has been undertaken to ensure that distance learning is facilitated - as this conference testifies - and considerable thought has been given to medium of instruction.

The media used for distance learning are as varied as the subjects covered but tend to concentrate on text - around which a highly sophisticated technology has evolved. There is also

growing interest in audiotape, video, radio and TV, teleconferencing, computer-based learning, electronic mail, facsimile transmission and even satellite tutoring (Gough 1984, p17). Education technology is an essential element in most distance learning courses, whether through the use of some or other technological medium to aid instruction or through the use of a systems approach to course development.

When considering medium of instruction, one is dealing with a topic where everyone has his or her pet theory about what it good or not so good but many workers have been asking - sometimes in desperation - whether there are any advantages in departing from the tried and true and what, exactly, will be best for their students.

LEARNING FROM MEDIA

As in the medical field, where researchers seek the panacea or at least an ad hoc miracle drug to cure the common cold, cancer or diabetes, so too in education: media are regarded by many as the instructional equivalent of the philosopher's stone. There is, of course, no instructional elixir but many researchers have endeavoured to establish just how effective media are in learning. Their work suggests that the issue is controversial, to say the least, although most agree there are benefits in certain areas:

- Efficiency. One area in which the researchers agree is that learning from media produces benefits of efficiency (Clark's reply, in Petkovich and Tennyson, p238; Jamison et al, pp55-57; Kulik et al, 1980, p538; Kulik et al, 1983, p24). Bright (1983) refers to "the CAI phenomenon" - the tendency for computer-based instruction to provide similar results in markedly shorter time. Findings of time saving over traditional instruction appear to be common in research work

on individualised instruction.

- Attitude. Learners generally display more positive attitudes to learning and to subject matter which is presented by computer (Kulik et al, 1980, pp537-8; Kulik et al, 1983, pp24-5; Bangert-Drowns et al, 1985)

- Disadvantaged learners. Jamison et al, (1974 p55); Kulik et al (1983, pp25-6); Bangert-Drowns et al (1985, p66) all claim benefits for disadvantaged students of learning from media. Local empirical research - such as the work being done at the University of the Western Cape - provides strong support for this contention (eg: Sinclair and Dennis, 1981; Kansky 1981; Delpierre 1985; Vermeulen and Oberholster 1985).

- Older learners. Bangert-Drowns et al (1985, p66) also note that "older students seem to profit more than younger ones from the independence and choice..." in computer-based learning, although this is in a high school rather than an adult learning context.

- Distance learning. The Open University has gained a good deal of experience with distance learning and computer-based education (Cooper and Lockwood 1979). They cite benefits in respect of:

  - Flexibility. Learners can choose lessons at one of the two hundred terminals throughout the UK;

  - Objectivity: the standardization which is inherent in this form of teaching;

  - The speed which which courses may be modified if required; and, most tellingly:

- The impossibility of providing any effective alternative form of tutorial support, particularly in highly specialised courses with small numbers of students (Cooper and Lockwood 1979, p257).

Moreover, student assignments can be marked and feedback obtained far more speedily using computer technology than is the case with traditional instruction. This must be beneficial for distance learners.

It is assumed that the problems of the South African education being what they are, a reasonable proportion of adult distance learners will come from educationally deprived backgrounds. Many will be studying under trying circumstances - indeed, the very act of learning at a distance can be very trying, with many students feeling a strong sense of isolation. This is exacerbated if assignments cannot be returned from the marker expeditiously.

Thus, the evidence cited which points to benefits for disadvantaged learners, attitudinal gains, time savings through greater efficiency and the benefits claimed in respect of distance learning provide a fair prima facie case for considering the use of computers and other instructional technology in distance learning.

APPROPRIATE TECHNOLOGY

Some workers have expressed concerns about technological transfer (eg: Dib, 1980, p250; Romiszowski, 1980, p238; Papagiannis, 1982, pp259-60; Pena, 1983, p17). To some extent, their worries may be allayed by the application of "appropriate technology".

Kerr (1982 pp228-9) gives detailed consideration to Schumaker's descriptions of "appropriate" and "intermediate" technology.

This is technology which is relatively simple and labour intensive, concentrating on rural rather than urban areas and local consumption rather than export. Just how applicable such standards are in education is debatable: Kerr, however, gives a number of examples of the use of educational technology in different countries such as Afghanistan, Botswana, the Philippines and India. South Africa, of course, is not a "lesser developed country" in the same way those are.

The concept of appropriate technology makes sense in that technology must be applied which is indeed suitable for local needs. It should also include a high level of local participation, social interaction and control. Seen in that light, one understands that technology itself is neither innately advanced or backward; appropriate or unsuitable. It is the context which determines the extent of its appropriateness (see Kerr 1982 p231). Stewart (1985 p65) concludes that technology need not be inappropriately used if the socio-cultural contexts in which it was developed and in which it is used, are clearly recognised. What is appropriate in South Africa may be quite unsuitable in South Korea - or it may not be. Quick generalisations are impossible.

TECHNOLOGY AND DISTANCE LEARNING FOR ADULTS - AN APPLICATION

Distance education for adults where the learners choose the time, place and circumstances of learning (as per the definition above) and educational technology clearly have much to commend them in the South African environment. It is proposed that a network of community learning centres be established across Southern Africa which use (appropriate) educational technology for adult and other learners. In fact, the learners do not have to be adults but the centres should function according to accepted principles of adult education, providing for individual self actualization, for individual development or for social transformation, as

described above. The choice of philosophy to rest with the members of each community.

If this seems a little too much of all things to all men, it need not be. Educational technology, especially computer-based education, is enormously flexible and can easily be used to take on the particular philosophical bent of the people who use it.

Picture a set-up where there are maybe four microcomputers in a small learning centre (larger centres may have ten or twenty). The computers will be supplemented by videotape players, possibly linked to and controlled by the computers. There will be texts, reference works, audiotapes, gramophone records, filmstrips and other necessary learning materials.

The centre could be anywhere: in a church hall, a school, a library, community centre, or even a private home. It could be run by one person, although two would be better if it is to stay open for long hours (which it should). This would not be too expensive to support. Once the initial outlay has been made, staff salaries, maintenance costs and other operating costs covering electricity, cleaning materials etc would be all that have to be met.

There are probably three key elements in this scheme. Firstly, the community must need it and want it enough to support it. Secondly, it must be run by the right people with enough entrepreneural flair to opercome people's resistance to change. Thirdly, there must be enough money available, for, as Hurly and Hlynka (1984, p430) wisely point out, "trying to innovate in an economy of scarcity is next to impossible".

On a purely practical level, there is a fourth element needed - electricity. Somehow, one has to ensure a stable, continuous supply of electricity, which is not necessarily easy everywhere in Southern Africa.

There is no need to give more detail of the hardware or the setting. Of greater importance is the courseware. Lesson material is critical to the success of any such venture, as it is in all distance learning. There is good, packaged courseware available which is suitable for the South African market and this can be used quite safely. However, I suggest that interested groups may wish to organise courseware generation teams to produce material suitable for their specific needs. Naturally, this takes time, effort, skill and money. The first two items are products of dedication. Skill can be acquired and I know there are experienced developers who would be happy to share their knowledge with people in such a community project. Money? Well, there are sources, if you know where to look and how to market your appeal.

Even assuming a project gets going using existing courseware, it might quite reasonably offer the following courses:

- English - primary and high schools
- Mathematics - ditto
- Algebra
- Precalculus
- Calculus
- Physics
- Chemistry
- Biology
- Physical science
- Computer literacy
- Word processing
- Programming
- Sales
- Management
- Keyboarding

There are bound to be others. The concept allows for learners to

use a centre staffed by one or two people to do all the above subjects, which is a pretty economical use of human resources. The equipment could also be used to assist local businessmen through the use of business software.

Those in the community who might benefit from the concept include:

- School children: primary and high school
- Teachers, for improving their subject knowledge and improving their qualifications
- The unemployed or other non-economically active people, for vocational or academic courses
- Students from teacher education colleges
- Students from technical colleges
- Students from commercial colleges
- Adults, for academic subjects or vocational courses

Learners could use the equipment to supplement teaching given elsewhere or as the sole source of knowledge. The centres could be regarded in Illichian terms, as providing knowledge resources for learners and the extent of their acceptability would soon be clear from the uses to which they are put.

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THE ROLE OF RADIO AND TELEVISION IN DISTANCE EDUCATION

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SABC

1. Introduction

The community has a continuous need for and expectation of the provision of education. Although the community assumes that the educational system will provide this need, this is not always the case. The provision of education is a worldwide problem and therefore the question arises whether the present system can provide a solution for this problem. Problems that exist in the provision of education are mostly related to the formal school system. It seems that the formal school system is not capable of fulfilling the needs of the community. There is sufficient evidence for the problems experienced in several industrialized countries to substantiate this claim. The following are a few of the problems that have arisen:

* unemployment among school leavers
* financial problems connected with the provision of education
* an unexpectedly high enrollment at universities

H.S.R.C (1981:19)

The questions below reflect the inadequacies of the school system as identified by international research:

* Is the school system capable of providing education corresponding to needs and demands?;
* Can the resources as required by education bodies and systems be provided?;
* Can education be provided at the same tempo as in the past?

Van der Stoep (1984:15)

Few countries can afford the traditional way of providing for education and therefore it seems that distance education is an alternative and supplementary way of fulfilling the educational needs of the community.

2. Defining distance education

'The term 'distance education' covers the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or in the same premises but which nevertheless benefit from the planning guidance and tuition of a tutorial organization'.

Sewart et al (1983:9)

Perraton (1982:4) defines distance education as '. . . an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the student'.

Keegan (1982:8) identifies, amongst others, the following characteristics of distance education:

* the separation of teacher and student;
* the influence of a teaching discipline which distinguishes it from private study;
* the use of technical media, usually consisting of printed material, to connect teacher and student;
* elements of a more industrialized form of teaching in which activities like job scheduling feature.

The following bodies and their activities form part of the total distance education concept in South Africa:

* University of South Africa (UNISA);
* Vista;

* Technikon RSA;
* Colleges for Further Training;
* Correspondence Colleges;
* SABC.

Engelbrecht (1986:6)

3. Why the need for distance education?

In general the tendency of the past few years has been for the demand for classroom accommodation to outstrip the resources of the national economy. These growing needs and the accompanying pressure on education systems hold implications not only for the traditional primary, secondary and tertiary categories but, as a result of technological advances, also for all forms of adult education that are recognized as contact education.

The demand for providing traditional education has grown so rapidly that the full implications of contact education is beyond the means of most countries. Around the world and particularly in developed countries alternatives were sought to provide in the educational needs of individuals and groups.

Engelbrecht (1986:7)

Distance education as alternative to formal education allows widespread access, economies of time and overhead expenses, and, particularly, flexibility and diversity of application.

Perraton in Sewart et al (1983:37) argues the case for utilizing distance education as an alternative medium on the following points:

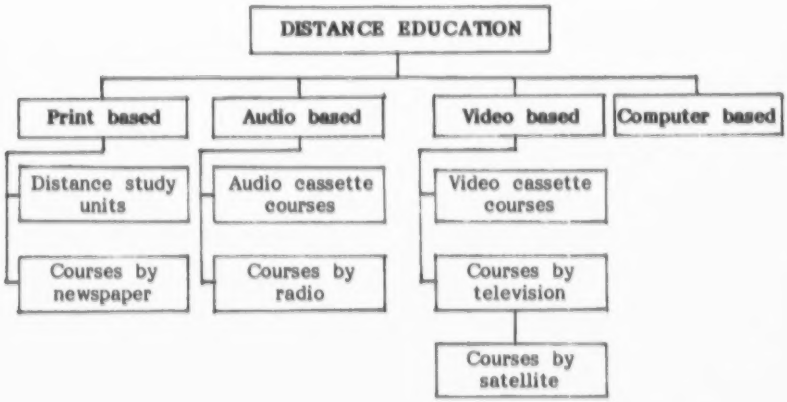
* Distance education can break the integuments of fixed staffing ratios which limited the expansion of education when teacher and student had to be in the same place at the same time;

- An increase in the number of teachers is removed by distance teaching provided that distance teaching is no more expensive than teaching through orthodox methods;

- There are circumstances under which distance teaching can be cheaper than orthodox education whether measured in terms of audience reached or of learning;

4. The choice of medium in distance education.

The following represents forms of distance education distinguished by the medium which is the basis of the learning materials. The medium carries the content of a distance education course.



Keegan in Sewart et al (1983:16)

In this paper the accent falls on the role radio and television play in providing distance education.

Du Plessis in Engelbrecht (1986:8) indicates that the present total number of distance education students represent a mere 4% of the total number of students accommodated by the formal education system. When this figure is related to the total population, it drops to 1,2%. If this fact is taken into account, it is clear that educational radio and television is capable of playing a supporting role in providing distance education, since this field contains vast expansion potential.

Chu and Schramm in Sewart et al (1983:36) analyzed the literature on the comparative methods of different media seeking differences between print, radio, film, television and the classroom reacher. Most of the research suggests that there are no significant differences between them in their educational effectiveness. While differences between students or audiences and differences between subjects have a major effect on how easily something is learned, differences between media seem to be far less important.

5. The utilization of broadcast educational radio and television in distance education

Bates in Holberg (1983:227) identifies three main trends with regard to the utilization of audio-visual media in distance education systems.

- There is a movement away from using broadcasting by distance learning systems;
- The range of audio-visual media suitable for distance education is increasing;
- The potential of audio-visual media still tends to be under-exploited by distance learning systems.

The question arises why there is a trend away from broadcasting, especially seen in the light of the role educational radio and television can play in supplying the distance education need. The contribution of ER and ETV must be examined more closely with regard to distance education.

Young et al in Sewart et al (1983:23) refer to the distinct advantages of broadcast radio. There is sufficient evidence in developing countries that radio was used to great effect in French and English speaking Africa.

The advantages of radio are its almost complete availability and its ability to reach isolated audiences quickly and relatively inexpensively. It has certain strategic functions:

- accessing students;

- enrichment and motivation;
- publicity and recruitment;
- variety;
- pacing.

Regarding television and the special characteristics that make it an indispensable partner in distance education, the following:

Much work was done in the 1970's to identify those didactic problems that are better presented on videotape of television than by face-to-face lecturing or print:

- illustration of principles involving dynamic change or movement;
- illustration of principles involving two or three or n-dimensional space.
- presentation of geographic features etc.

Bates in Sewart et al (1983:224)

Despite the particular characteristics of radio and television which make them eminently suitable for educational purposes, Bates in Sewart et al (1983:229) states that there is a movement away from the use of the media, and that not only radio and television, but audio-visual media in general are underutilized. Bates sums up the situation by posing the following question:

> 'Why is it that broadcast television and radio services with their glamour and appeal, their ability to reach mass audiences, many years of experience in educational broadcasting and their potential influence appear to be playing so small a role in the development of distance learning systems?'

The reply from Bates can be summed up as follows:

> 'A broadcasting service is provided by an organization (a national broadcasting organization) separate from the distance learning system. Despite high costs, problems of

recruitment and the difficulty of fully using expensive facilities most institutions wanted their own television production facilities.'

The main reason is their lack of control over production material. Satisfactory cooperation between broadcast organizations and educational institutions seems difficult to achieve in most countries.

* Another reason is getting adequate transmission facilities. Most institutions were dissatisfied with the quality of the times available, particularly for broadcast aimed at adults.

It is not surprising that broadcasting organizations are unwilling to make available peak viewing or listening times to small specialist audiences. It must be assumed that, worldwide, viewers of ETV programmes constitute a minority. Serious teaching even in distance education systems is rarely aimed at mass audiences in broadcasting terms.

Bates cites the problem of academic distrust as one of the most important. Those responsible for the academic content of courses had rarely received any training in audio-visual media.

Educational television world-wide has the complex task of integrating the world of education (content) with the world of TV (medium) while informing and entertaining the learner audience (target). The content world is dominated by the teaching professions and educational psychology stressing intellectual appropriateness and development. The medium world is dominated by directors, producers, artists and media psychology stressing the visual domain. To the traditional target TV is the movieset and the entertainer. These worlds meet in reaching the target audience through the message via formal (curriculum centred), informal (enrichment) and non-formal (work centred) programmes.

Another important reason, according to Bates, is the lack of an educational theory that can provide clear guidelines as to the unique advantages of television and radio over print or face-to-face teaching. Few of the institutions were able to specify why television should be used instead of print.

Despite the existing problems in and limitations to utilizing broadcast radio and television, their mass media contribution to solving educational problems in this country cannot be ignored. Though radio and television may not necessarily make the most dramatic impact on the terrain, they can definitely contribute to the solution. Radio and television must therefore be applied in those areas where they excel.

* ER and ETV can play a role in making material more accessible, to reduce the distance between teacher and student and act as motivation for the learning gesture.

Engelbrecht (1986:11)

Apart from broadcasting ETV programmes of a non-formal and informal nature for all ethnic groups as part of the normal programme schedule of the SABC, a school radio service, the programmes of which are compiled in conjunction with the Department of Education and Training, is operated. All broadcasts are supported by appropriate material: in the case of school radio this includes pamphlets, posters, and the text of the lesson.

To ensure the proper utilization of ER and ETV in the future, the following matters must receive attention:

* **The partnership between broadcast authorities and the users**

Optimal use of ER and ETV requires a balanced relationship between the broadcast service and the users of ER and ETV to achieve a meaningful involvement on the part of the user.

* **The symbiosis of radio and television in educational programmes**

In educational programmes radio and television complement each other and should function as a whole.

* **The importance of continued research**

Continued research within an educational broadcast context to determine the needs of the target groups, the effect of broadcasts, target sizes etc, is vitally important and should be carried out continuously.

- **Publications and other support material**

  The central idea is that publications and other support media together with continued research constitute the cornerstones on which an educational broadcast service should be built. Such additional material is aimed at teachers and students for preparatory and aftercare purposes and consist of further printed matter, worksheets, transparencies, slides, audio and video cassettes.

- **The necessity of following an educationally integrated method of programme planning**

  The underlying principle is that programme planning should not be haphazard, but an orchestrated action within the broader and often officially determined blueprint for education.

  Experts such as academics, teachers, specialist advisors etc participate in a structured manner in the planning and execution of all programme projects.

6. Conclusion

Rapid change on technological, socio-economic and political fronts have created learning needs which traditional education approaches can no longer supply adequately. In South Africa the problem is aggravated by the linguistic, cultural and ethnic variety in conjunction with the shortage of trained and educated manpower. It is my opinion that ER and ETV can play a constructive, decisive and vital role in meeting part of the total need within the current educational infrastructure of the country.

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THE POTENTIAL OF SOUND CASSETTES IN DISTANCE EDUCATION

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INTRODUCTION

Stories regarding 'Baron von Münchhausen' are well-known to those interested in German folk-tales. One of the stories describes how a postillion tried to blow his horn. Owing to the severe cold weather, the horn was frozen and not a single note was heard. Some time later, while the party was having their meal, the horn thawed, and the most beautiful music came forth from it. This possibility to capture sound and reproduce it at a later stage became a reality when Valdemar Polsen introduced his wire-recorder in 1898.

The possibilities of the tape recorder as an instructional medium were quite clear right from its early days, but a real break-through was only accomplished when PHILIPS announced their standardised cassette in 1963. From then on people, and especially students, would have access to a relatively cheap, readily available and standardised instrument capable of recording sound and playing it back at a later stage - the new version of Von Münchhausen's horn.

Owing to the absence of face-to-face contact in distance education, the lecturer has to rely solely on extrinsic media to convey the learning content. Ochoa (Neil, 1981:34) refers to this aspect when describing distance education as "a system based on the selective use of instructional media - both traditional and innovative - that promotes the self teaching-learning process to achieve specific educational objectives, with a potentially greater geographic coverage than the traditional face-to-face system of education".

Although printed matter is seen as the basic medium of distance education (Holmberg, 1981:61; Schramm, 1977:205), it surely has its draw-backs, just as all the other media. It seems that the written/printed word is often impersonal (Jenkins, 1981:46/47) and just does not have the subtlety of the spoken word (Freysen, 1985:35). It is in this regard that the sound cassette does not have a special potential, which should be further explored. Therefore we are going to have a look in particular at the intrinsic, communicative and didactic potential of the sound cassette, and also refer to some of its draw-backs.

INTRINSIC POTENTIAL

The term 'intrinsic' is being used to refer to the distinctive attributes and utilisation possibilities of a specific medium. When discussing the intrinsic potential of the sound cassette, it is necessary to include both the cassette recorder/player, as well as the cassette itself. According to Bates (1983:238), the suitability of media for distance education is determined by the convenience of use, availability, academic control and user friendliness of a medium.

The cassette as medium is easy to handle. In comparison to the open-reel recorder, the loading of the cassette is easier and faster. The standardised format of the sound cassette in contrast with video formats, enables the user to play the programme back on any cassette player. This attribute is of great importance to distance education in so far as it facilitates communication in a cost effective way. The straight forward control options and built-in facilities like the Automatic Level Control (ALC) makes this apparatus very easy to operate, even by a non-sophisticated media-user.

The sound cassette is accessible to the tele-tuition student. The cassette recorder is relatively cheap and therefore within the reach of every student. Owing to its size and the fact that the cassette recorder can work on battery power, it is portable. This portability makes it possible to use this medium at any place, even on the way to or from work (McDonald & Knights, 1979:48; Singer, Dilloway & Ganjamie, 1976:54 et seq.). In comparison with radio programmes, the cassette recorder is not time-bound. Programmes can be replayed at any time; even problems regarding the environment can be overcome by using earphone facilities.

Both lecturer and student have control over the medium to a certain extent. One of the reasons why the sound cassette is relatively popular amongst lecturers, is the fact that they feel they are in control of this medium (Bates, 1983:233). This control refers to both the *production* and the *use* of programmes. On the other hand, students also have control over this medium as far as they can determine *when, where, the frequency, the tempo* (by means of pausing or by using the 'compressed speech' control available in some machines, or skipping some sections of the programme) and *adjustment of the volume and tone controls according to personal choice.*

This medium lends itself to user friendliness. Because of the attributes of the sound cassette as well as the encoding possibilities, user friendliness to a high degree can be obtained.

COMMUNICATIVE FACTORS

When sound is used to present reality, it may be called a 'sound-image'. Sound-images, like visual-images, can be used in different ways for communication purposes (Peters, 1972:35). As cognition and learning are based upon symbolic presentation (Salomon, 1981:3), it is essential to have a look at the rôle that sound-images can play in the communication between the lecturer and the student in distance education.

Sound-images can be used to represent reality. If the lecturer has as objective the recognition of a specific sound, he can (in a face-to-face situation) expose the student to the sound and clarify it further, verbally. This approach presents some difficulty in the distant education situation where printed material is normally used as the medium. By using the sound cassette, the specific sound can be captured on magnetic tape; further clarification can then take place through the same, or another medium.

Sound-images can also be used to simulate reality. Here the emphasis is not on the image being true to life, but upon an interpretation of reality. A Shakesperean play recorded on sound cassette would be an example of simulated reality. Although the use of background sound-images may make these programmes more realistic, it cannot be anything but fiction.

Sound-images can express or evoke emotional experiences. Background music or sound can be used to express or evoke emotional experiences such as fear, tension, exitement and joy. Print cannot compare to auditive media when it comes to the creation of context or affective influencing/motivation.

Sound-images can involve the student subjectively. When the listener gets the impression that the programme is directed towards him as a person, he becomes subjectively involved. By using the first and second person, maintaining an informal conversational tone, the individualised character of distance education (Sewart, 1983:13) is furthered and the feeling of isolation can be lessened (Freysen, 1985:34). If possible, time indicators such as "good morning", must be avoided as it can influence communication adversely - especially when the student is studying late at night!

Research (Le Roux, 1978:46) also indicates a student preference towards a personalised method of instruction.

Ideas coded into sound-images can be transmitted by means of the sound cassette. Beside the verbal message, there are also analogue codes such as rhythm, intensity, pitch, tempo and intonation (Fourie, 1982:103 et seq.) to be considered. These codes render a greater versatility of expression (than is the case with the printed word) to auditive media. This attribute makes the sound cassette an ideal medium to further cognition. In cases where the student is blind or illiterate (e.g. in nonformal education)(Wells, 1976:4,98) the sound cassette as medium to transmit learning content, has a great potential.

The sound cassette can be used to observe an aspect of reality. It has already been mentioned that the cassette can be used to represent reality. Students therefore can study recorded discussions (including telephonic discussions with the lecturer), radio programmes, music programmes as well as other sound-images. The recording can also be used to study progress. A student can for example record his initial attempt as well as later attempts and compare them in order to see his improvement regarding audible actions (music performances, speech or instruction).

DIDACTIC POTENTIAL

The statement: "The uses of audio media are limited only by the imagination of teachers and students" (Heinich, Molenda & Russel, 1982:147) is perhaps a bit over optimistic. The crux of the matter is that auditive media are versatile, especially used in conjunction with other media (multi-media usage). During this discussion we will limit ourselves to the potential of the sound cassette as independent medium.

The cassette can be used to inform. Should the lecturer find it necessary to inform a student regarding an aspect of the subject, the sound cassette is as good a medium as any other (Moore, 1981:11) - there is no 'super medium' (Van Zyl, 1981:166). In comparison to print, a sound cassette may be:

* More easy to prepare; printed material usually has to go through a lot of channels before it is ready for distribution.
* More effective, owing to the available analogue codes, for conveying information.
* More motivational, owing to the emotional involvement that is possible with the sound cassette.
* More expensive, regarding the basic material and postage. The re-use of the

cassette naturally will bring down costs in comparison to printed matter that is not re-usable.

* Less referable owing to the intrinsic nature of the medium. Reference and cross-reference poses problems.

The cassette can be used to elucidate. When a cassette is being used to elucidate other material, this material fulfils the primary rôle in the conveyance of the message, while the cassette plays a secondary rôle complementing it. Students experiencing problems with printed material might find a cassette elucidating the printed material very useful (Le Roux, 1978:13; Van As, 1983:16). As "... intonation, hesitation, and vocal variety all shape what a word actually convey ..." (Moore, 1981:6), the sound cassette can contribute to a large extent elucidating printed material and textbooks.

The cassette can be used to instruct. Instructional sound programmes often are a combination of information and elucidating programmes. Part of the programme can be devoted to the conveying of information (learning content) in order to obtain certain instructional objectives, whereafter which the student is referred to other media for further information. These other media are then elucidated by the sound cassette. This method is also known as the audio-tutorial or Postlethwaith system. This must not be seen as an attempt to replace the lecturer by the sound cassette; he stays the planner, co-ordinater, organizer and implementer of the programme (Briel, 1983:19). Sound cassettes can be used for specific instructional purpose such as explaining, revision and drill excercises (Heinich et al, 1982:148 et seq.; Yule, 1984:9-11).

The cassette can be used for evaluation. The sound cassette, as has been said before, can be used to record audible performances in order to evaluate the progress being made. Students who experience physical problems, like hand injuries, may also choose to do their assignments or examination orally, which is then recorded onto cassette and forwarded to the lecturer. Certain subjects lend themselves, more than others, to be evaluated in this way, for example the determining of a person's language fluency and proficiency.

The cassette can be used to give feedback. Feedback on a student's assignments usually takes place through the written word. The lecturer might find in some cases that the spoken word, with its analogue codes, would be a better medium for giving feedback. In such a case, the lecturer might consider using a cassette (Le Roux, 1978:39). Although this method of feedback opens the possibility of a more

comprehensive feedback, I do not foresee that this way of feedback will be implemented on a large scale, owing to certain practical problems.

SOME LIMITATIONS OF THE SOUND CASSETTE AS INSTRUCTIONAL MEDIUM

Notwithstanding the potential of the sound cassette as instructional medium, notice should be taken of some of its limitations. Some of these are:

* The sound cassette can only accommodate **auditive symbol systems** and their respective analogue codes.
* Some students learn more easily through visual media (McDonald & Knights, 1979:49 et seq.); the sound cassette therefore would not be the applicable medium.
* In order to obtain a programme of high technical standard, the lecturer must have access to sophisticated apparatus and technical assistance.
* A well-planned programme, especially in cases where a multi-media approach is considered, the compiler of the programme must, besides his subject knowledge, have a working knowledge of educational media and instructional communication.
* The dispatch of cassettes requires special packaging and a higher postal rate.
* The full length of a cassette is seldom used; the lecturer should therefore continuously consider the cost efficiency of the cassette as medium.
* Later additions usually imply that a new programme has to be made and this is often very time-consuming.
* Owing to the nature of a sound-programme and the differences between the counters of different machines, this medium is not very referable. However, this problem can be overcome by the Zimdex method of indexing (Kemp, 1980:195; Rahmlow & Pedrick, 1978:52).
* The medium is as good as its programme. The lecturer/compiler of the programme should therefore take note of the technical, pedagogic/andragogic and didactic criteria as well a some practical consideration when planning and producing the programme (Freysen, 1985:Chapters 4 & 5).

CONCLUSION

The initial training of man will always be insufficient due to this dynamic nature and the accumulation of information and knowledge. Because of financial and other reasons, further training will increasingly take place by means of distance education. In order to decide whether the sound cassette is the applicable medium

to convey a message between the lecturer and the tele-tuition student, it was necessary to discuss the technical, communicative and didactic potential thereof.

Although not a panacea, the sound cassette should be considered as medium for distance education owing to features such as its convenience, availability, inexpensiveness and effectiveness.

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THE USE OF SATELLITES FOR DISTANCE EDUCATION: A NEW MODEL FOR SOUTH AFRICA

by I. URAL

Introduction

Since the early 1960's the world has undergone a serious educational crisis. In both industrialized and economically underdeveloped nations, there has been an accelerated need for the expansion of education at all levels. This situation is caused by a population explosion (Learner & Schramm, 1976) and by increasing demand for more credentials, more qualifications, and better skills to survive in a contemporary society (Ward, 1974). Ironically, government expenditure for education has been steadily rising throughout the world for nearly thirty years (Unesco, 1986).

This educational crisis has been felt even more strongly in many Asian, African and Latin American countries where expansion of the schools, with limited resources and trained teachers, cannot meet the demand, even within the next generation (Perraton, 1981). In the case of South Africa these problems have been coupled with inadequate access by many groups: rural blacks, dropouts of the formal structured system, and those who had to leave school to contribute to their families' earnings. It is during this time that the concept of open learning or distance education using a multi-media educational process is viewed as a viable alternative to traditional institutional structure to provide programmes that reduce educational costs, improve quality and relevance of education while expanding educational opportunities.

The Mass Media for Distance Education

Distance education systems provide programmes with a heavy emphasis on multimedia in which the teacher and learner may never meet face to face. The learner may study at home, in a group under supervision, or partly at home and partly in a seminar with an instructor. He may receive instruction by radio, television, telephone or even by mail services, which play an important role in delivering, collecting printed and recorded materials. This form of education is emerging since many societies have not been able to meet their educational requirements through traditional educational structures.

Another advantage of distance education encorporating modern communication technology for South Africa is that it makes provision for millions of Black illiterates to have access to knowledge even if they cannot read or write. Broadcasting media deliver "educational information and experiences widely, quickly, vividly, with a realism and immediacy that print could hardly match" (Schramm, 1977, p. 13). Radio and television offer flexibility, impact and nationwide accessibility and enable "educationally disadvantaged listeners and viewers ... to study many serious topics providing interest and comprehension are sustained through the use of dramatization and personification" (Anderson, 1974, p. 312).

Educational technology can meet the increasing demand for qualitative education more rapidly than conventional methods. It would be unrealistic to forecast that in the decades to come there will be a sufficient number of trained teachers in South Africa for both the formal and non-formal systems of the country as this would require a heavy investment in time, resources and means for training suffi-

ciently qualified instructors. Rural areas suffer most from this shortage of skilled personnel. The quality of and access to education in rural areas could be substantially improved by the transmission of educational programmes.

The current trend in distance education is moving toward the systems approach which requires a group of specialists to work together for a common objective and lends itself to accountability and evaluation techniques which are more scientifically designed than those used in traditional forms of education. Once the educational requirements of the target population are analyzed the emphasis will be on "multimedia". No single medium can teach effectively for all purposes and all target populations all the time. Educationalists in the new distance teaching system will integrate media into the curriculum so that the strengths of each medium are exploited and disadvantages are counter-balanced. The most important aspect of the instructional system therefore, should be the multimedia correspondence package. Each course or training programme will consist of multimedia packages, many of which may require the return of assignments by students (Ural, 1982). These modules will be supplemented by a series of television and radio programmes, short summer weekend courses and regionally-organized tutorial and counselling systems.

A great advantage of distance education courses is that they are prepared by specialist course teams. In South Africa this will include subject matter specialists involved with the course, producers of the SABC radio and television programmes, educational technology specialists, who will advise on course design, objectives and

assessment techniques and a staff tutor who will provide the link between the central course teams and the regional services in the rural areas. Course teams for both the in-school programmes and the short training programmes for the adult learners will include a course coordinator whose task is to regulate the work of the groups within the distance education system, such as the publishing office, the media library, and the graphic designers. Therefore, the academic responsibility for course material will be vested in teams which is in contrast with the traditional pattern, in which each lecturer is solely responsible for his lectures, and the number of students attending each teacher is rather limited. In direct contrast, the distance education courses based upon the multimedia approach will be directed to several thousands of learners. They should also be open for inspection outside their own academic environment. This will lead to collective academic responsibility and accountability in education.

Satellites for distance education

In both industrialized and developing countries, no other use of modern communication has so much interested the planners concerned with economic and social development as the possibility of using broadcast satellites for educational purposes (Schramm, 1979). Developing countries usually do not have extensive and efficient networks on the ground for domestic communications. Therefore, satellites are uniquely suited to rural developing countries and their " ... use will be appropriate or cost-effective" (MacKenzie, 1975 p. 482). Also, "It is quite possible ... that for a developing country, a television system based upon satellite links might ulti-

mately prove cheaper than conventional methods of distribution" (Bowers, 1979). Satellite communications can rapidly develop a communication system which meets many diverse needs, i.e., telephone, television, radio, education, healthcare, etc. Thus, in developing countries the satellite may serve as the backbone for the entire communications system (Block, 1978). This situation differs from that of advanced countries where the communication system has developed gradually and the satellite represents only a component of the entire system.

Another common characteristic of many of the developing countries is their geographical conditions (MacKenzie, 1975). Insularity, the presence of vast equatorial forests, desert and mountainous areas are not condusive to ground networks, whereas space systems overcome these difficulties easily when relatively small ground stations are put into operation. Large countries with geographical barriers can improve their communication capacity either by renting transponders from international organizations like Intelsat or by using regional satellite better adapted to their specific national needs.

The developing countries frequently have problems in educating their populations and in carrying social services to remote parts of their territory. The use of direct or semi-direct TV broadcast satellites may help these countries to overcome the shortage of skilled teachers in addition to improving their communication capacity thus making it easier to spread basic knowledge to whole populations in such vital areas as literacy, family planning, health education, agricultural programmes and other related programmes to improve rural life.

Selected case studies of satellite experimentation

Since satellites can deliver signals over wide areas at a reduced cost several countries are using satellites to expand, diversify and enhance their educational and development programmes. One of the most extensive projects began with the successful launching of the ATS-6 satellite which is a very powerful and versatile satellite. It is the sixth in a series orbitted by the National Aeronautics and Space Administration (NASA). The experimentation was designed to deliver programmes to meet various educational needs, such as career education, environmental awareness, and pre-school skills as well as a variety of health related services. A series of specially designed programme materials has been developed, aimed at people scattered over thousands of square miles of rugged, mountainous, remote territories (Norwood, 1976). Prior to ATS-6 experiments there had been minimal applications of satellite technology to social services anywhere in the world (Filep, 1975). Alaska experimented with ATS-1 and ATS-3 satellites which only had audio channels. The inherent capabilities of the satellites were limited when compared to the scale of ATS-6 with its television and radio capabilities and its potential for two-way communication or interaction. The ATS-6 was also the first communication satellite to have enough power to transmit to relatively small and inexpensive ground stations.

Another crucial experimentation that used the capabilities of ATS-6 for education delivery is the Educational Technology Demonstration conducted by the Federation of Rocky Mountain States with the following objectives:

1. To demonstrate the feasibility of a satellite based media distribution system for isolated rural populations.

2. To evaluate learner attitudes and the cost of various delivery modes using a variety of materials.

The project's focus was on career education to provide career content to a specific audience and to develop the content of programming in order to increase the individual's control over career decisions. The project started with a regional needs assessment to determine a set of high priority content objectives which have been incorporated into three major areas of career development: assessment, understanding careers, and implementation. Programmes also considered in detail the ethnic and cultural differences of the different target groups.

Since the satellite system has multichannel capability some transmission time is devoted to a programme service called "Materials Distribution Service". This service makes available to users a library of films and videotapes which is transmitted via the ATS-6 video channel during the times allocated in the broadcast schedule for materials distribution. The project also has a digital interactive subsystem by which large, widely dispersed audiences can actively and simultaneously participate in a creative mode with the programming. The system is computer managed and has audio response capabilities as well.

Alaska: ATS-6 Distance Education Experiment

Alaska uses the satellite in order to improve the quality of tele-

communication planning within the state and to determine the effective uses of satellite technology. The ATS-6 was the first satellite to transmit television and multiple voice channels to low-cost earth stations. These experiments explored the use of more efficient advanced telecommunication systems for educational purposes. Alaska experiment has a large evaluation component to determine the effectiveness of the programming and also generated data on operation of the satellite, ground stations and other related hardware.

The four broad topics and content areas have been selected for courseware to be broadcasted over the satellite. The identification of these topics is based upon needs assessment conducted by the Alaska State Department of Education.

1. Instructional programming is in the area of early childhood development, Basic English oral communications skills, intercultural exhange and in-service teacher training.

2. Interactive health programmes has the objective of delivering various aspects of health care and to educate health professionals in remote areas.

3. Viewer defined programming. This programme broadcasts current interest topics in several native languages through the four audio channels of the satellite.

4. Public Broadcasting service. The aim of this service is to determine the public reaction to live programming as contrasted to programmes transmitted after delays ranging from twelve hours to one month. The experiment has confirmed at a significant confidence level that live programmes increase viewer interest

and consequently the audience size. This information is useful in determining demand in planning for operational communications system requirements.

Appalachia: ATS-6 Satellite Education

The major objective of the Appalachian ATS-6 experiment was to demonstrate the feasibility of a large scale resource development over diverse geographical and demographic areas using a variety of communications distribution systems (Filep, 1975). The demonstration was developed for teachers to participate through several Regional Education Service Agencies located throughout Appalachia. Video and computerized in-service course material was developed and distributed by the Resource Coordinating Centre (RCC) located at the University of Kentucky in Lexington. The delivery system utilizes both the video and audio capabilities of ATS-6 and the audio-digital capability of ATS-3 to link the regional centers to the main resource centre. The results of the survey conducted by the Appalachian Regional Commission found that the teachers in rural areas learned from the programmes and expressed a strong desire for the continuation of the satellite broadcast in-service programmes which finally lead to certification.

India: Satellite Instructional Television Experiment (SITE)

> Thanks to satellites, it will be possible to improve living conditions in villages. But, at the same time, when our knowledge is increased, Thus we must know how to maintain new equipment, but also we must improve health conditons ... provide life values closer to rural culture ... which lead us to a greater mutual understanding in order to accept the benefit of the modernization without denying our roots (Gandhi, in Clengie, 1981).

India is particularly well suited for an experiment of the type as implemented by ATS-6. The population is distributed fairly evenly throughout the country, rather than being concentrated in a few large cities which could be reached easily by terrestrial distribution methods. There is no existing television distribution network, and the Indian subcontinent is of a convenient size relative to the antenna pattern of the ATS-6 satellite (Malik 1978, p.3). The Indian experiment was designed to meet the following three primary objectives:

1. Contribute to the family planning objectives.
2. Improve Agricultural practices.
3. Contribute to the national integration.

The experiment broadcasted instructional television programmes to more than 50,000 receivers throughout the country. Because of the number of languages spoken in different parts of the country, eight principle languages have been selected for the experiment: Hindi, Bengali, Kashmiri, Marathi, Gujarati, Oriya, Tamil, and English. Broadcasts ran from four to six hours a day. About 2000 of the villages involved received programs directly from the satellite, while the other villages were served by a combination of satellite and a newly installed microwave relay system. One of the significant aspects of this experiment, from the point of view of education, is the low cost of ground antennas. "The proposed antenna, which measures 10 feet in diameter, will be constructed as a simple brass frame covered with chicken wire. In production the unit cost is about $ 75 - a price that schools can afford" (Polycyn 1974, p. 14).

The community receivers (which received transmissions directly from the satellite) were located in twenty-eight clusters comprising 400 villages each. In order to include different cultural and linguistic settings, these clusters were spread out over different parts of the country. Initially, the plans for community reception required spreading these clusters evenly throughout the states of Uttar Pradesh, Bihar, Madhya Pradesh, Orissa, Rajasthan, West Bengal, and Madras. The sets in the rebroadcast areas were located in villages around Ahmedabad, Bombay, Poona, Delhi, and Srinagar, as the terrestrial television transmitters were already in these cities (Grayson 1974, p 23).

> It is interesting to note that all clusters are to be within the radius of approximately fifty miles. While the cluster radius was planned to aid in facilitating maintenance of the sets when required, its major reason is directly related to the Indian government's decision to continue the broadcast service after the experiment, via a small, inexpensive terrestial distribution system until its domestic satellite is ready" (Polcyn 1974, p. 15).

Complete statistical data on each village and its residents have been prepared for each cluster village. Research teams also visited villages in order to obtain firsthand information on actual conditions. The teams included, in addition to local leaders and social scientists, technical personnel who assessed the suitability of the location of inexpensive mesh antennas, television sets, etc. Also, support teams or maintenance groups were organized for each village partaking in the experiment.

A number of software pilot studies have been undertaken which have provided insight into the ways in which television can be used as a

direct instrument for promoting developmental tasks set by the Indian government.

> Community television receiving sets were placed in 80 villages in the general vicinity of Delhi, and half-hour, rural oriented programs are being broadcast three times a week; to date, experience indicates that it may be possible to make relevant changes in the development of isolated communities (Polcyn 1978, p. 54).

These pilot programmes have been on the air for years and have provided valuable experience in the design of rural broadcasts. In giving the summary of main findings, interpretations, and conclusions of these pilot studies, the Indian goverment's official report indicates:

> The main purpose of the inquiry was to assess the usefulness of television for family planning and social education. This was to be determined by measuring the shifts in information, attitudes and behaviour brought about in the 8418 members of the 180 Tele-clubs in the sample, as a result of viewing 20 special telecasts on health, citizenship, and in participating in post viewing discussions ... The data showed that there were in fact statistically significant shifts (Kumar 1970, pp. 76-77).

Preliminary results of the experiment seem to indicate, that approximately 43,000 teachers were provided training in Science teaching via satellite transmission with results indicating significant gains in content knowledge and positive changes in attitudes (Mulay 1977, p. 7). India has some 1.7 million school teachers in the first five grades of elementary school. Programmes were aimed at those teachers who had little or no training in various sciences.

Programmes for the elementary students were designed to enrich the school programme in the areas of community living skills, basic num-

bers concepts, reading and technology, hygiene and health, aesthetic awareness and modern society. Early evaluation results indicate that language development and information seeking were positively affected by SITE programmes while scholastic achievement, attendance, and teacher-student interaction were not. The SITE project proved that India offers a challenge to the use of satellites because it presents a classical example of heterogeinity (Horn 1971, pp. 15-17). Linguistically, culturally, and educationally, it is more diverse than many continents. If India can find a useful function for a television satellite in its efforts for education and national development in spite of its heterogeinity, then almost any potential user should be able to do so.

Conclusions and Recommendations for a South African satellite for Distance Education

The analysis of the selected case studies demonstrated the feasibility of using satellites in rural areas to deliver health and education services as programmes were received by populations who might not have been able to receive such services by any other means. In the case of South Africa which is culturally heteregeneous with a vast geographical area and limited resources, satellite technology can be used successfully to deliver education while providing interactive communication systems for the immediacy of effect. In South Africa, satellites would especially be helpful in reaching the faraway rural communities and upgrading the skills of the villagers in such vital areas as health, agriculture, economics, and family planning. This will alleviate the migration to the urban centres which contributes to already existing unemployment or underemploy-

ment. Satellite systems can also relay information to large numbers of people in their natural environment, thus making it cost effective on a per learner basis.

There is an encouraging and new venture by the private enterprise to launch a R360 million satellite over South Africa by November 1987. It is expected that the South African satellite will most probably be a third generation Hughes satellite. The third generation satellites are the most powerful satellites which can directly broadcast to relatively inexpensive receivers. Given the geographical terrain of the country and insufficient development of the microwave relay system the use of a powerful satellite is most appropriate for South Africa to broadcast health, education and training programmes. It must be emphasized however, satellite system is not the distance education system but, it is an integral part of it. With this in mind, the following suggestions are made to South African planners:

1. Begin with the needs, not with technology. The important fact is that South Africa needs to extend education and information that would justify a major system development. The system must grow out of the needs, and it must be designed to meet them effectively.

2. Begin with educational broadcasting, not with satellites. The users of the system will never see the satellite, but they will view the educational programmes it brings them. The important factor is that educational broadcasting complemented by multimedia packages will make a significant contribution to the country's educational and national development needs.

3. It must be a national system to meet both national and local needs. Work out in some detail, including sample programming, a phasing of the expansion, and an inventory of the resources that will be required.

4. Survey the resources in order to determine what will be required in the way of electronics industry, engineering and technical personnel, educational technologists, broadcasting personnel, field personnel. If not presently available in sufficient numbers, how can they be provided?

5. Encourage the schools of education by subsidy increases or withdrawals to move towards instructional science and accountability in education to train professionals in instructional technology, educational broadcasting, research and evaluation.

6. At the beginning of the project try to determine the problem of organization and control. A major system with thousands of employees whose efforts are amplified into daily national impact requires both freedom to be creative and imaginative and close contact with the substantive agencies of government, education, and culture that are concerned with a national information system.

7. Adapt a schedule that will move the country gradually into a national network of multi-media distance education through the use of a satellite. The detailed planning, the hiring and training, the work on content and curriculum, the scheduling, the production and testing of programmes, revision, will take two to three years before the service can go on the air in its full capacity.

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2028*

COMMUNITY INFORMATION FOR THE FUNCTIONALLY ILLITERATE IN SOUTH AFRICA BY MEANS OF AUDIO CASSETTES

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SUMMARY

1. Introduction
2. Dimensions of the illiterate problem
3. Community information
4. Role of the public library
5. Literacy programmes
6. Audio-tapes as an intermediate solution
7. Vaal Triangle Association for Library Co-operation
8. Requirements for successful community information services
9. The experimental phase
10. Conclusion

1. INTRODUCTION

A short definition of a functionally illiterate would be a man or woman, at least 16 years of age, who cannot read nor write. However, it is much too easy a definition for such a highly complex problem with far reaching consequences. Due to the shortage of time, I am unable to do an in depth study of the functionally illiterate. There are various levels of functional illiteracy, ranging from minimum schooling to literacy only in certain languages.

In practice illiteracy amounts to being unable to complete an application form for a bursery for your child, being unable to read the instructions on a medicine bottle, or to address an envelope, or to read a safety notice or a street name. Even the details of a child's age or birth date is a problem for these people.

What would it be like to be unaware of legal rights, medical, old age and other benefits, to occupy the lowest stratum of labour, or worse; to be unemployed and to be poorly prepared for life in the post-industrial society of South Africa? This constitutes the profile of the illiterate.

2. DIMENSIONS OF THE PROBLEM

The technological era has created a high mobility amongst the peoples of the world with the consequent confluence of cultures and changing human environments.

In order to adapt to their environment, to rely on themselves and to determine their own destiny in social-cultural, physical and political factors, people need to be well-informed and have the means to act on the information.

The illiterate and functionally illiterate are in the greatest need and are in a bitterly helpless struggle for information amidst isolation, inferiority and poverty. There is an universal outcry for knowledge from these educationally impoverished people and it has been estimated that one third of the world's population is functionally illiterate 23), and in some countries this proportion can be as high as 90%.

Illiteracy constitutes an international crisis and is indeed a world phenomenon. A wide range of studies indicate that there are 4.67 m. illiterate ethno-cultural minorities, mostly Turks, in the Federal Republic of Germany alone. Other illiterates are to be found in Canada, in Sweden 25), Britain and Jamaica 13) to name but a few countries. There are also 27 million in the United States of America 33).

In both developed and developing countries like Nigeria 2), Tanzania, Sri Lanka, Papua New Guinea and Nigeria 13) a number of research projects have identified high levels of information needs amongst illiterates.

Them, nearer home in South Africa, nearly 9 million Blacks are illiterate 27) Circumstances have forced Blacks fresh from tribal areas into urbanized and semi urbanized areas. Until quite recently these people, now labelled illiterate, always participated fully in the development of their tribal society. They are now considered ignorant and are denied that right of participation 23).

At a pre-seminar to the 1979 IFLA Congress, African librarians suggested that a new definition of illiteracy should be the exclusion

of a person with the necessary knowledge to live and work in society, even though he is unable to read and write 36).

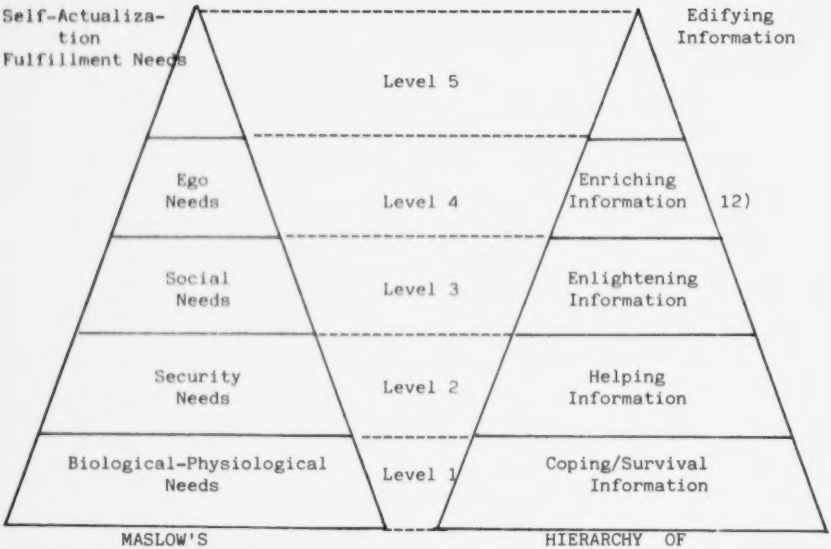
Appropriate information, specifically community information, must thus be brought to illiterates through means of modern media.

3. COMMUNITY INFORMATION

The British Library Association evolved the following definition of community information : 'Services which assist individuals and groups with daily problem solving and with participation in the democratic process. The services concentrate on the needs of those who do not have ready access to other sources of assistance, and on the most important problems that people have to face, problems to do with their homes, their jobs and their rights' 24).

Abraham H Maslow's 19) hierarchy of basic human needs may be applied to identify the areas of greatest need for information for illiterates. According to Maslow, man has values and tries to reach for, and achieve, his full potential. He describes a pyramid or hierarchy of five levels of values and needs, with survival, or physical needs and values at the lower level, and spiritual or self-actualization needs and values at the top.

Horton,12) an American information management consultant, applied these needs and values in juxtaposition with human information needs. The following figure attempts to do that by putting the two sets of needs and values side-by-side in the form of two pyramids. The pyramidal construction reinforces the notion that the more basic survival needs must be satisfied before more materialistic needs :



12)

This theory is reinforced by Zaaiman 35) who mentions that the majority of Blacks need information of a type that will suit their particular needs, and these often lie at the level of survival. Mchombu 16) states that the nature of a library in a Third World community must be in tune with the needs and culture of the very society it serves. Information must be provided at the primary level of basic education, a level which does not normally apply in the public libraries of the First World.

Manaka 18), thé authority on information needs of Blacks in South Africa, claims that the role of information to the individual arises from the situation in which the person finds himself. Most of these situations give rise to personal information needs, social information needs, educational needs and decision-making needs.

In general, Blacks may be regarded as information poor because they not only have limited access to information, but are also less aware of the value of information. Survival information needs are the greatest in the hierarchy of information needs.

A number of research projects have set out to identify the areas of greatest need for information. In Nigeria health, problems of daily existence, education, government affairs, religions, employment and opportunities were identified 2). Also from Nigeria Ogunsheye 22) mentions that information needs of illiterates can be grouped under the following four headings :

a. functional information for economic survival
b. functional survival information for the exercise of civic and political rights and acceptance of social responsibility
c. social and cultural information for leisure and religious observances
d. educational information for discerning and adapting to cultural and social change

In Papua New Guinea economic development and community welfare 1), were identified as major information needs.

Due to the scrapping of influx control in South Africa, new Black residents also need much information to adjust quickly and comfortably to this new way of life, according to Manaka's 18) four headings.

Personal needs:

- Coping with trauma and crises such as divorce, death and addiction
- Information on available benefits and housing
- Family and health counseling
- Advice on self-protection, taxation, rentals, elections, recreation, news and current events
- Physical needs

Educational needs:

- Advice how to assist children with their studies
- Available benefits in education
- Available adult education and literacy programmes

Social needs:

- Coping with a fast changing world
- Understanding traditional culture
- Understanding the black experience : pass raids, the impact of township removals, township music, etc.
- Understanding Christianity placed in juxtaposition with African religion.

Decision-making needs:

- To satisfy needs in work environment
- Information needed to make decisions in all aspects of life, especially for Blacks who have risen and who are rising to positions of prominence in their communities.

All the different theories on information needs, indicate that a high level of need for information exists and that the precise nature of the need depends on the type of society in which they live. This information can and will lead to 'improvement in living conditions, the removal of restrictions on opportunity, education and literacy, cultural development, and the development of skills and the opportunity to undertake self-development'. 11, pp 44-45)

4. THE ROLE OF THE PUBLIC LIBRARY

The role of the public library in providing information to the developing black communities is advocated by numerous organisations and writers. 2, 14, 18, 22, 26, 34). The entire community has access to public library services offered by municipal and other local authorities, in most cases with the support of the provincial administrations. These services are designed to complement formal education, to raise the cultural and intellectual standard of the community and to offer a source of healthy recreation. The services of the public library are available to every literate member of the community to :

- broaden his education and knowledge in an informal manner through the use of books and other writings;
- obtain information on any subject;
- find information about his work or his hobby;
- continue his studies;
- promote his social usefulness and participation in group activities;
- obtain literature for recreation 21).

However, various factors influence the role which the public library can play in supplying the required information to Blacks. Illiteracy and low average standards of education are the major barriers preventing individual access to information, but also the absence of a reading culture and the prevalence of an oral tradition plays a role.

There is also little printed information available in the vernacular languages, and little information printed for adults with limited reading ability who have graduated from literacy classes at a level and in a language that they can comprehend. The literature that is available in the public libraries often reflects attitudes and modes alien to these readers.

The poor support of the Black libraries in the Vaal Triangle, Evaton, Residentia, Zamdele, Rephengotso, Sharpville, Boipatong, Bophelong and Sebokeng is evident from statistics of numbers of library users and book issues against residents in the bookyear 1983/84. However, the recent Black unrest should be taken into account. Of a total of 165 000 residents in 1984 there were only 8 570 library users with a book circulation of 31 740, thus a percentation of 3.3% 31).

Ogunsheye 22) from Nigeria noted that all developed nations at one time or another have used libraries to extend literacy and education to their illiterate populations; Africa can hardly afford to do otherwise. Zaaiman 34) reinforces this statement in connection with the role that the public library played in the upliftment of the poor Whites in South Africa not many decades ago.

In South Africa in 1986 at the South African Institute for Library and Information Sciences Conference a Sub-committee on The role of libraries in the advancement of social and economic development in South Africa was launched. At the same conference the University of South Africa was requested to conduct a research programme on the same subject. This programme is being undertaken by the University of South Africa's Department of Library and Information Sciences under the leadership of Prof R B Zaaiman. This report is to serve before the 1987 Conference of the South African Institute for Library and Information Sciences.

Shillinglaw 26) states that the key to national development is the upliftment through education, literacy, and the acquisition of occupational and personal skills. The public library, then, as an education, information, and cultural agency seems to have an important contribution to make to a developing country.

In 1982 the government created the National Advisory Council on Libraries and Information (NACLI) mainly to mobilize the information capabilities of the public and the private sectors for optimal use.

A bridge must be formed between the library which has the information contained within books and recorded material, and the illiterate who requires this information but is unable to obtain it because it is in a format he cannot use.

5. LITERACY PROGRAMMES

Various literacy programmes are in progress in major urban areas like Cape Town, Durban and the P.W.V. area. It will however, take two to three decades for these programmes to reach the masses, and in the meanwhile the information requirements of the masses are overwhelming. Their illiteracy remains a problem, as does the unaccessability of the existing information.

6. AUDIO-CASSETTE TAPES AS AN INTERMEDIATE SOLUTION

A relatively cheap solution would be the making of audio-cassette tapes; cheaper in relation to books which the majority of Blacks cannot use in any case, and much cheaper and more easily used than video tapes.

Such audio-tapes could supply the basic community information of illiterates for the next two to three decades. Publications on various basic information topics could be made in an easy, clear style and then be translated into the idiom of the various African languages like Zulu, South Sotho, North Sotho, Xhosa and Tswana. These translations could then be read onto tapes and distributed by means of public and school libraries, depots, shops, clinics and mobile 'tapecoteque' combis.

Talukder 30) mentions that informal centres with plenty of practical information and audio-visual aids could be the first step toward a national library network. Aboyade 2) used audio-cassettes as part of an experimental library project in Badeko, Nigeria in August 1982 which formed part of the RUDIS project. The RUDIS project was based on the belief that library and documentation services can unify all information distribution efforts and provide constant interaction between rural people and information providers.

During a survey at different furniture shops which Blacks frequent, it was established that nearly all households in the Black areas owned radios and that 99% of those radios have built-in cassette players. This medium is thus readily available for the distribution of community information on cassette tapes. Libraries, clinics and combis should also provide cassette players so that patrons may listen to tapes at the distribution points if they do not have cassette players at home.

7. VAAL TRIANGLE ASSOCIATION FOR LIBRARY CO-OPERATION

The Vaal Triangle Association for Library Co-operation 9) decided at a meeting on 27 August, 1986 to form a committee consisting of Mrs A P du Plooy, Mrs R Dirmeik, Mr A P Duvenage and Mr Vincent Leutsoa. They were to investigate the possibilities of a programme to distribute community information on audio-tapes amongst Blacks, first on an experimental basis in the Vaal Triangle and later throughout South Africa.

Various parties and persons were approached for comment, including Prof T Van der Walt, Rector of the Potchefstroom University of Christian Higher Education, Dr W de Klerk, Editor of Rapport, Dr A Rupert, Chairman of the Rembrandt Foundation, Prof C Nöffke, Director of the Institute for American Studies of the Rand Afrikaans University, Prof Zaaiman, Professor in Library and Information Science of the University of South Africa, Prof D Vermaak, Director of the Research Institute for Educational Planning at the University of the Orange Free State, Prof P H Coombs, Director of The International Council for Educational Development U S A, Mr E French of the Human Sciences Research Council and different government officials like Dr J H Schoeman of the Department of Health and Population Development, Min. G Viljoen and Dr Ben Fouché of the Department of Education and Development Aid, Min. G Viljoen of the Department of Education and Training and others. Their reaction was positive and enthusiastic.

8. REQUIREMENTS FOR SUCCESSFUL COMMUNITY INFORMATION SERVICES

What kind of community information services are needed to distribute the audio-tapes?

One of the main purposes of this paper is to urge the government to greater effort, and to encourage local governments and private enterprise to put into effect their responsibility to improve and extend this field of non-formal education. The public library could be the main channel with additional distribution by depots, clinics and mobile libraries or 'tapecoteque' combis. The public library can provide important resources of print and audio-visual materials, staff skills in using information and follow-up service for the benefit of a large illiterate community. Also it can provide a venue for classes and a base for instructors.

Public libraries must be planned and an administrative infrastructure created in conjunction with other agencies for non-formal education to amalgamate the forces of non-formal education, according to Shillinglaw 26). More emphasis should be placed on finances equip existing facilities as community information centres and also for special individual topics which may be relevant to one particular community only. If there is no community centre, this task must be undertaken by the mobile libraries and clinics.

According to Coombs 8) it is important to aquire a balance between different educational needs and 'to identify those that merit first attention' 8, pp 307).

Secondly, those priority needs must be identified, and those things that can ultimately have the greatest leverage in broadening and strengthening the nation's overall learning network must be selected. The nation must provide for the bulk of educational expenditure. The South African government provides a huge sum of money for the educational needs of children and students, but very little for the information needs of the illiterate. This imbalance hampers the developmental needs of the society.

9. THE EXPERIMENTAL PHASE

Audio-tapes on community information needs (see addendum) could be prepared by an independant utility company with a board of directors from the Black community and/or by different government departments. The tapes may be recorded in the main African languages as well as Afrikaans and English with the idea of extending this service to the Coloured community. The potential extent of national distribution

outlets throughout South Africa are numerous. According to Musiker 20) there are 213 Black, 203 Coloured and 17 Asian public libraries and 3 630 Black school libraries. These may be seconded as main channels of distribution.

At national level there are thousands of clinics of the Department of Health and Population Development which can also act as distribution channels. Feedback from these clinics indicate that they are only too willing to help. The Department of Education and Training have 400 centres of nonformal education in black areas of South Africa which can be approached to also act as distribution channels.

At each regional area there has to be one major resource centre for neighbouring communities. At these centres the relevant information would be collected and distributed. The excellent literature for new literates that the Department of Education and Training and other concerned parties are preparing may also be distributed in this manner.

To implement this audio-tape community information service, one would have to begin on an experimental basis, for example, in the Vaal Triangle using the two main African languages of South Sotho and Zulu spoken there.

VAAL TRIANGLE - BLACK POPULATION AND A COMPARISON OF THE LANGUAGE GROUPS

CHILDREN		ADULTS	TOTAL
279 500		370 500	650 000 28)
Southern Sotho	50%		325 000
Zulu	21%		136 500
Xhosa	13%		84 500
Tswana	7%		45 500
Northern Sotho and other ethnic groups	9%		58 500

30% or 115 150 of the adults are literate and 259 350 are illiterate. This includes a large percentage of children who are not attending school. Southern Sotho and Zulu are understood by most Blacks. These two languages could be used initially. A Black library in the Vaal Triangle could be chosen for the experimental phase, monitored by the Human Sciences Research Council.

Philip H Coombs in a personal letter advises that : it would be of the utmost importance to convince both potential financial supporters and key people in the Black communities that this is a viable and useful idea, vital to their upliftment.

The first step would be to prepare several sample audio-tapes that they could listen to, and comment on. Until funding organizations listen to such a sample of tapes, they may be hesitant to become involved in helping to build a new institutional structure at substantial cost.

Secondly, the ultimate success of the tapes will depend heavily on involving respectable people in the Black community in developing the project from the outset. Therefore, the incorporation of a 'Listen and Learn Centre Utility Company' and the appointment of a board of directors of influential people from the Black community may be the answer.

This company with offices and personnel will prepare and distribute the audio-tapes. It will be seen as something that Blacks are helping to do for their own people in co-operation with Whites.

Panels of Black citizens in Black communities (Black librarians of Lekoa libraries and Black faculty memebers at Soshanguve Training Centre have already been consulted) could be formed to advise on priority needs and topics to be covered. They can pre-test new tapes before they are disseminated, and formulate questions to be included on tapes in the planning stage.

Care must be taken, and tapes will have greater credibility if recorded by knowledgable Blacks in their own languages, and not simply as literal translations from 'White languages'.

Thirdly, simply distributing tapes locally on a more or less random base may have only limited effect. They would be much more effective if an effort were made to form small neighbourhood listening, discussion and action groups at the public library, at the clinic, at home or any appropriate venue. Each such interest group could meet from time to time to listen to a tape attuned to their particular

needs, and interests, then discuss the message and how to apply it to their particular locality and even what line of action to undertake. Feedback from such discussion groups would be welcomed.2,13)

Fourthly, the first year or two should be treated as a preliminary probing and experimental phase. With a modest amount of 'seed money' and the extensive use of able and interested volunteers, the capacity to produce effective tapes on a sample scale and a lively local demand and use of such tapes, will make fundraising relatively easier.

A model or project library should be established in for instance the Evaton Public library. The Human Sciences Research Council may conduct a research on the viability and impact of the audio-tapes at this library.

In every instance the library, clinic, depot or mobile library must be prepared to do follow-up work. For instance, if a parent is interested in a bursary for his child, forms must be available at the library or centre and the person involved must be oblidged to fill in this form, to address it and send it away to the appropriate persons. For instance, if information on government matters is needed and it is not available on tape, the assurance must be given that the information will be provided as soon as possible.

The experience obtained from, and the success of this experiment would be of vital importance in the establishing of this integrated network of community information. Interested and concerned parties will hopefully then be willing to get financially involved.

CONCLUSION

South Africa is moving towards a period of accelerated development which is aimed at the improvement in the quality of life of the black population in South Africa.

The audio-cassette can fill the vacuum that exists in information distribution for the benefit of the functionally illiterate who are incapable of using book materials. This basic community information on audio-tapes will be a supplementary service to that of literacy programmes, schools

and libraries. This can only lead to enlightenment and a more informed community. This community will then be able to cope with the accelerated development now taking place, and contribute meaningfully to the political, economic and social spheres of the Republic of South Africa.

I thank you for the opportunity to deliver this paper on a subject cardinal to the livelihood of millions of people in the Republic of South Africa.

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ADDENDUM A

FOREWORD

1. Each category may contain one or several cassette-tapes, according to the volume of information contained within that specific category.

2. Large corporations, firms and employers may contact us about the information needs of illiterate employees in hostels and in different work situations, e.g. in the mining industry. Tapes may be compiled according to their specific information needs.

3. A master cassette-tape will be distributed throughout the country but at the end of the lecture, local information will be added, e.g. 'Meals on Wheels' stops at the corner of Smith and Jones streets on Thursday afternoons in Sebokeng.

   This last piece of information is added to the tape to be distributed in the Vaal Triangle.

4. Research done by the Human Sciences Research Council, has established that information supplied in dialogue form has far more impact. Mere reading aloud onto the tape by a single person does not appeal to the listener.

CATEGORIES 4)

1. ADVICE AND LEGAL SERVICE
   - 1.1 Legal aid, solicitors
   - 1.2 Divorce
   - 1.3 Small claims courts
   - 1.4 Citizens Advice Bureau, consumerism, elected representatives, housing, adult education, bail, equal rights, insurance and annuities.

2. BUSINESS
   - 2.1 Small firms information and how to start your own business.
   - 2.2 Management and supervision.
   - 2.3 Aids to financial management
   - 2.4 Insurance for your business.
   - 2.5 Buying and selling techniques.

3. CHILDREN AND YOUTH
   - 3.1 Child minding, playgroups, crèches and nurseries.
   - 3.2 How to cope with abuse and neglect, adoption and fostering, delinquency and deviancy.
   - 3.3 Entertainment : clubs, sports, community centres, libraries.
   - 3.4 Etiquette and dating.
   - 3.5 Sexual instruction.
   - 3.6 Young people and alcohol, drugs, smoking and unacceptable behaviour.
   - 3.7 Exceptional children and their problems.

4. CONSUMER

4.1 Pre-shopping advice, complaints, Black Consumer Union.

4.2 Hire-purchase versus cash.

5. CURRENT AFFAIRS

Johannesburg 100, disinvestment, forced township removals, forced evictions.

6. DEATH

Cemetaries and crematoria : coroners, funerals, registrars. Insurance and pension benefits.

7. EDUCATION

7.1 Schools and boarding schools.

7.2 College, correspondence schools and universities. Educational grants and scholarships.

7.3 Pre-school educational activities.

7.4 Adult education, evening classes and community centres.

7.5 Literacy and literacy projects (Second languages, foreign languages, numeracy, spelling, writing, reading).

7.6 Child study

7.7 Methods of study

7.8 Self development and character education.

8. ELDERLY

8.1 Benefits and services for the over 60's : travel concessions, discounts, clinics, 'meals on wheels'.

8.2 Welfare, pensions, clubs, day centres, organizations, homes, community centres.

8.3 Health and hygiene : Blindness, deafness, chiropody, therapy, etc.

8.4 Pre-retirement preparation.

8.5 Retirement and pension.

8.6 Saving for an annuity.

9. EMPLOYMENT

9.1 Domestic servants' course.

9.2 Gardeners' course.

9.3 Careers and job opportunities.

9.4 Health and safety at work.

9.5 Dismissal, maternity leave, exploitation, unemployment, discrimination, permanent and temporary job conditions.

9.6 Dept. Manpower and their training and employment, other training opportunities like those of the Dept. of Education and Training.

9.7 Pensions and sick benefits.

9.8 Job centres and employment agencies.

10. FARMING

10.1 Various farming programmes for different areas.

11. FOLK TALES

Variety of stories from different tribes and ethnic groups.

12. HEALTH AND WELFARE : MEDICAL SERVICES

12.1 Health services and clinics, hospitals, nursing homes, benefits and rights.

12.2 Family planning : contraception, sterilization, vasectomies, hysterectomies, abortion, adoption and childlessness and infertility.

12.3 Pregnancy and post natal care.

12.4 Health and diets, slimming, allergies, diabetes, etc.

12.5 Heart attacks, strokes, T B, diabetes.

12.6 Basic hygiene

12.7 First aid

12.8 Venereal diseases

12.9 Handicapped people

12.10 Homoeopathy

12.11 Immunisations and vaccinations

12.12 Health insurance and medical schemes

12.13 Mother and babycare

12.14 Mental health and illness, psychiatric hospitals.

12.15 Women's health

12.16 How to obtain spectacles, dentures, crutches, wheel chairs, etc .

12.17 Sangomas.

13. HOME

13.1 Prevention of home accidents and burglaries

13.2 Home planning and interior decoration

13.3 Financial planning and monthly budgets

13.4 Gardening with vegetables, fruit and flowers

13.5 Home renovation : paint, insulation, roof mending, etc. Glazing, woodwork, plumbing, electrical wiring.

13.6 Keeping pets : cats, dogs, birds, etc.

13.7 Practical farming : keeping chickens, etc.

13.8 Home management : how to be a good housekeeper

13.9 Entertaining

14. HOUSING AND ENVIRONMENT

14.1 Environmental changes and the effect on culture

14.2 Landlord and tenant : responsibilities involved and how to go about renting a home

14.3 How to buy your own house

14.4 Survival housing and squatting

14.5 Ratepayers and residents

14.6 Building regulations

15. LOCAL AUTHORITY SERVICES

15.1 Local authorities and available services, elected representatives and civic and political rights and acceptance of social responsibilty, etc.

16. MUSIC

16.1 Music of different ethnic groups of lasting historical, social and cultural value.

17. NUTRITION

17.1 Basic recipes : bread, meat, cake, vegetables

17.2 Balanced meals

17.3 Baby and child food

17.4 Preservation and storage of food

17.5 Importance of vegetables

17.6 Entertaining

17.7 Dietics : slimming, diabetics, heart disease and other specific conditions.

18. PEOPLE AND PLACES

Here the aim is educational in the broadest sense, i.e. material which stimulates personal development, broadens the mind and promotes a greater awareness of other cultures and values.

18.1 Interesting people : Dr. Martin Luther King and others

18.2 Famous in history : King Tshaka, Mosheshwe and others

18.3 Adventurous lives

18.4 War experiences

18.5 Our world

18.6 Our country South Africa

18.7 Our neighbouring countries

18.8 Exploring nature

18.9 Biographies

19 PERSONAL LIVING

Personal, spiritual and emotional development : self improvement with emphasis on the social graces, grooming, manners and conversation

19.1 Self awareness

19.2 Make the most of yourself

19.3 Self-defence

19.4 One-parent families

19.5 Alcoholism and drugs : effect on families and where to go for help

19.6 Suicide : effect on families and where to go for help

19.7 Cohabitation and the law

19.8 Your identity documents

20. RECREATION AND SPORT

20.1 How to play it ...

20.2 Summer sports

20.3 Winter sports

20.4 Sport facilities, parks, pools, local organizations and clubs

20.5 Training : cycling, jogging, roller skating, running, athletics, weight lifting, karate, boxing, etc.

20.6 Holiday guides

21. RELIGION

21.1 Passages from the Bible

21.2 Religious organisations and churches

21.3 Devotional literature, your personal religion, etc.

21.4 Christianity in juxtaposition with African religion

22. STORIES AND STORYTELLING

23. TAXATION

23.1 Personal income tax, licences : motor cars, motor cycle, TV, radio, trade, etc.

24. TECHNOLOGY

25. TRANSPORT

25.1 Public transport

26. YOUR FAMILY

26.1 Caring for the elderly

26.2 Child care and exceptional children

26.3 Cultural and sociological changes

2029*

THE BOTSWANA EXPERIMENT : THE FEASIBILITY OF COMMUNICATION TECHNOLOGY IN A DISTANCE LEARNING INNOVATION IN SOUTHERN AFRICA

R Kenneth Jones and Kathlene Higgins

Introduction

The Republic of Botswana is a landlocked area of approximately 222,000 miles, which is about the size of France or Kenya. To the south and east it is bounded by the Republic of South Africa and to the north and west by Namibia. To the north east it has as its neighbour Zimbabwe while at the confluence of the Chobe and Zambesi Rivers it touches Zambia. The population is one of the most rapidly urbanising and 80% live in the east along the railway line. Nevertheless the tiny population of under one million is mainly rural and occupies a vast territory. Educational resources are scarce and there is an extreme shortage of trained manpower.

Distance delivery would appear to lend itself to the unique characteristics of the country and to its specific requirements. There have been attempts in the past to use distance delivery of some description. From 1960 - 1965, for example, teachers were trained from Harare (Salisbury) using correspondence, and from 1967 - 1970 a further group of teachers were trained by correspondence using a one-off experimental approach at Francistown in the north of the country. In 1973, 1976 and 1979 three Radio Learning Group Campaigns were conducted throughout the country using distance learning materials such as study guides and printed matter. A Presidential Directive in November 1973 established the Botswana Extension College which is now the Department of Non-Formal Education (DNFE). Junior Certificate and 'O' level courses are offered by correspondence.

Training and professional qualifications are urgently required for the estimated 2,000 individuals in Botswana who spend their lives working with adults. Thus it was decided to introduce a

pilot programme which would offer a Certificate of Adult Education by distance delivery for a number of reasons. Firstly, to a developing country it is important that people are not required to be released from the labour market. Secondly, with a student population which is relatively dispersed (the students in the pilot programme were literacy assistants working throughout the whole of Botswana) it is important to use a method or teaching which requires a minimal reliance on a face-to-face teaching element and in which the learner is independent. Lastly, because this cadre was denied access to a conventional method of presentation studying by distance delivery was the only means open to them.

The Certificate in Adult Education was, therefore, piloted as a part-time course designed to provide a basic training in Adult Education for people already in the field. The intention was to utilise distance teaching methods combining face-to-face tuition with correspondence study. The face-to-face components were to include a total of six weeks each year on campus in Gaborone and up to a total of six study weekends each year at designated centres.

The Students

The minimum entry requirements for the programme included at least one year's experience working in some branch of adult education, and a Junior Certificate. A variety of reasons may prevent young people from any further study : they may have too poor a pass to qualify for Form IV entry; they may not be able to afford their school fees; many females become pregnant and attrition is nigh at this stage; parents may want children to work the lands. All these reasons were given by the interviewees when asked why they had not enrolled for the Cambridge course of study as part of their formal schooling. Range and level of the pilot course content were obviously affected by the participants'

minimal formal education, but also the language (English as a second language), type of activities, instructions and assignments included in the materials had to be taken into account in view of the limited academic experience of the students. However, their experiential knowledge was considered the crucial basis on which the academic content of the programme would develop, hence the work experience requirement.

Given the background to the conception of the programme, the first intake in 1983 of twenty five students were all Literacy Assistants employed within the DNFE. In their work they had contacts with other extension agents, and some of them acted as secretary to the Village Extension Team (VET) which comprised the Agricultural Demonstrator, the Veterinary Assistant, the Assistant Community Development Officer and the Family Welfare Educator. Literary Assistants lacked both professional and academic training, and as a concomitant their perceived expertise and status was considerably diminished in the eyes of their peers on the VET.

The Development of the Programme

The Institute of Adult Education held a number of discussions with DNFE staff in order to identify aims and the eventual content of the programme. Two general aims emerged :

- to develop academic and practical principles of adult education

- to introduce and develop skills of organisation and management of basic education provision at village level

The two year programme comprised five courses, two in the first year and three in the second. The two first year courses were considered 'foundation' courses, and were as follows :

(i) Professional English

Basic grammar is included in the context of study skills and professional skills. The course includes writing reports, minutes, official letters, composing telegrams and so forth. This was intended to combine skills immediately relevant to the study skills component of the course and practical skills for village level activities.

(ii) Learning and Teaching in Adult Education

Three main subjects or units of study were included :

a The Psychology of Adult Learning
b Planning and Implementing a Course
c Evaluating Learning and Teaching

In all, these three units comprised fifteen topics, each intended to form two weeks work - a thirty week course. It includes activities and assignments which will demand a variety of practical responses and which they could comply with only in a job situation involving adult education activities; for example - observation and reporting, experimenting, implementing and evaluating.

The second level courses, though planned at a higher level of difficulty, also reflect the experientialist nature of the entire programme :

(iii) The Structure and Organisation of Adult Education
(iv) Planning and Implementing Basic Education Programmes
(v) Adult Education and the Community

Writing the Materials

The lack of specialised Course Writers produced some logistical difficulties in the early days of the course. The English component was written by a member of the University's own Faculty of Education but the adult education section necessitated an interim measure whereby a consultant was brought in for one month from Nairobi who was skilled in the design of distance teaching materials for just this type of course. In addition, three members of the Institute's staff also began work on designing and writing the course. Eventually a full-time writer was recruited in the United Kingdom. In addition to the writing of the course funds were available for engaging part-time editors and graphic artists.

The Organisation of the Programme

The physical environment and the restricted infrastructure of the country engendered their own problems such as untarred roads and poor communications. There was an absence of any form of technological contact such as radio programmes, tapes, videos, television or even telephones, which meant that personal face-to-face tuition assumed a pre-eminent role in the pedagogy of the programme. The importance of maintaining contact in order to encourage morale and motivation was uppermost in the minds of the organisers. The history of distance delivery programmes so far highlights the isolation of the student as a major factor in attrition.

Communication Technology and Distance Teaching Innovation in Botswana

A UNESCO case study carried out by the senior author at the end of 1984 examined the use of communication technology in distance education in Botswana. The report covered the existence and

potential of telecommunication services in Botswana from a perspective of regarding such services as a perceived benefit for business, social welfare and education. Any forecasting of telephone demand has to consider fluctuating developments in population growth, economic growth and housing. In Botswana telephone traffic was estimated to increase on average four-fold over all urban areas by the year 2,000 and the demand for telex three-fold. The intention to introduce digital technology in all telephone networks realised the advantage of being able to connect widely dispersed pockets of population. The many Remote Area Dwellers in Botswana can most appropriately be served by satellite INTELSTAT'S VISTA system is designed to provide low density telephone, telegraph and low speed data transmission services. Another possibility is a mobile satellite earth station which could, as with MOBILITY '84, be housed in a Land Rover, as was done in Swaziland.

Botswana's rural areas are characterised by : difficulty of access; large internal migration (from rural to urban areas); high rate of population growth; economic dependence on traditional subsistence agriculture; almost total lack of communication facilities (and maintenance back-up); a large proportion of inhabitants in settlements of less than five hundred. Chief among the problems of RADs are : isolation and dispersion; lack of access to roads; insufficient communication, transportation and educational facilities; inadequate provision of social amenities and medical care; lack of telecommunication facilities and lack of financial resources. The feasibility of building in any sort of communication technology into the Certificate in Adult Education was therefore very remote.

Possible communication systems for local areas include radio call service, using 1kw transmitters at the base station with different frequencies capable of transmitting a service to twenty subscribers equipped with a 120 watt receiver. Again, one could use VHF and

UHF systems as a viable replacement for open wire lines. Video conferencing or computer technology is, for the forseeable future in Botswana, out of the question.

Conclusions

Although it is obvious that courses offered by distance delivery would appear to lend themselves very adequately to Botswana the concomitant telecommunications packages would appear to be difficult to envisage. Broadcast television is a non-starter in Botswana for some years to come. Even if it were shortly to be a viable proposition technical difficulties would preclude its use in any but urban areas. Rural areas are for the most part wholly without electricity. Broadcast radio is on-going but no figures exist as to the number who receive such broadcasts. Technical difficulties abound in terms of maintenance and reception, and the relatively high cost and inflexibility of transmission make it prohibitive to small numbers. Botswana's population is still under one million and the numbers undertaking any academic course would be extremely small. The exception would be the ill-fated National Literacy Scheme which uses radio programmes for less than thirty minutes per week. Print material has been used successfully in many previous and on-going programmes. The Certificate in Adult Education produced a number of successful course materials. The main problem is the postal delivery. In a country the geographical size and complexity of Botswana it can often take five or six weeks to reach areas such as Ghanzi. In this pilot programme Central Transport Organisation lorries and Red Cross aeroplanes were used successfully on a number of occasions. Video cassettes are impractical, and for the near future impossible, given Botswana's current technological development. Audio cassettes are a strong possibility being cheap to produce, cheap to reproduce, can be battery operated, and allow for flexibility of use, mastery learning, practice in problem solving, case studies, etc. Telephone tuition is a possibility

in the urban areas but not teleconferencing. Out-of-zone telephone tuition might be very expensive.

Present correspondence/distance learning courses in Botswana -

Department of Non-Formal Education
(Ministry of Education)
Junior Certificate and Cambridge 'O' Level
National Literacy Campaign Material

University of Botswana
Certificate in Adult Education
Diploma in Theology

N B : None of these offers any technology

Future possible correspondence/distance learning courses in Botswana -

Joint Ministry of Education/University of Botswana
Upgrading of teachers *
Certificate and Diploma in Accountancy and Business Studies **
Selected Fourth Year Nursing Courses
Training of various Health Personnel
Training of 2,000 Extension Workers ***

* an estimated 45% are untrained
** the next Five Year Plan to 1990 estimates some 750 students
*** no training exists at present for these 2,000

It is clear that at present communication technology in relation to distance education in Botswana must limit itself to radio broadcasting, audio cassettes and telephone tutorials. There is

a serious crisis in relation to untrained teachers and to a shortage of post-secondary trained manpower as a whole. Conventional teaching methods not only cannot keep pace with the situation as it is at present, but finds itself increasingly unable to accommodate the backlog of those who have received no training at all.

THE USE OF AUDIO-CASSETTES IN DISTANCE EDUCATION

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INTRODUCTION

The educational potential of audio-visual media still tends to be under-exploited by distance education universities. This is the opinion of Tony Bates (1983 : 227), a Reader in Media Research Methods and Head of the Audio-Visual Media Research Group, in the Institute of Educational Technology at the Open University of the United Kingdom.

According to Bates (1983 : 238) the reasons for this cannot be understood without first answering a more fundamental question: do distance education systems need audio-visual media? Just because the technology is there, do we have to use it?

In some ways, says Bates, it is hard not to use it. Teaching takes place in the wider context of people's lives. In everyday life they use television and the telephone for reasons other than learning, and often distance education systems need to use technology to access their students in the first place.

But the main reason why Bates (1983 : 238) believes it is important to use a wide range of media, including audio-visual media, is that different media serve different educational functions. Thus using a media broadens the range and effectiveness of distance education.

Of course, some subjects may be mastered more easily through an educational medium such as audio-cassettes than through other media. In distance teaching universities throughout the world, audio-cassettes are widely used. (Rumble and Harry, 1982) As early as the beginning of 1961 the Department of Romance Languages at Unisa started offering Italian and French language courses by intensive use of audio-tapes. The results proved extremely succesful. The use of audio-programmes was subsequently extended to the other language courses offered by this department,

as well as to other language teaching departments, such as German, Russian and Hebrew. (Le Roux, 1977)

By 1977 audio-cassettes were being used as a teaching method in as many as 16 departments (a total of 44 courses, representing 37 language courses, 5 music courses and 2 non-language courses). (Le Roux, 1977) In 1986 there were 150 courses in which audio-cassettes were used and over 281 558 audio-cassettes were sent out to thousands of students.

AUDIO-BASED LEARNING

The literature shows that broadcast radio has distinct advantages, especially in developing countries. Young et al. (1981) report extensive use of radio in French and English-speaking Africa and in Latin America.

The advantages of radio are its almost complete availability and its ability to reach isolated audiences quickly and relatively inexpensively. It has four strategic functions: accessing students; publicity and recruitement; variety, enrichment and motivation; pacing. (Sewart, 1983 : 223) According to Bates (1983 : 229) it also has many disadvantages and to these may be added the necessity of requiring students to listen at fixed and often awkward broadcast times and the judgement that it is more successfully used as a motivator than as a carrier of course content.

A decade of research at the Open University of the United Kingdom on the use of non-print media in distance education by Bates and his associates has led to the finding - which may come as a surprise to many - that the "greatest media development during the Open University's 12 years of existence has been the humble audio-cassette." (Bates, 1983 : 233)

Audio-cassettes are inexpensive, simple to operate, durable and portable. Studies carried out in a number of distance institutions in developed countries show that every student with few exceptions in the 1980s, either possesses or has access to an audio-cassette recorder. Individuals can control the time and place (a car in a traffic jam) at which learning from audio-cassettes occurs. They can be reviewed and played as often as needed and provide a confidential setting for two-way communica-

tion between teacher and student. (Sewart, 1983 : 223) Institutions like the Centre National d'Enseignement par Correspondance in France, which have extensive ranges of courses in modern languages and music, have always been extensive users of audio-cassettes and the CNEC has shown how audio-cassettes of exceptional didactic quality can be produced with relatively cheap equipment.

THE DISTANCE STUDY CONCEPT

According to Holmberg (1981 : 11-13) the main general characteristic of distance study is that it is based on non-contiguous communication. The learner is at a distance from the teacher for much, most, or even all of the time during the teaching-learning process. The basis of distance study is normally a pre-produced course, which is usually printed but which also consist of presentations by media other than the written word, for instance audio-cassettes or video-tapes, or television and radio programmes.

The course aims to be self-instructional - to be accessible for individual study without the support of a teacher. Holmberg (1981 : 12) further points out that organized two-way communication takes place between the students and the university. Communication in most cases is based on assignments for submission, which are commented on and returned to the students with constructive advice. Communication also takes place through the initiative of students and individual tutors. The most common medium used for this two-way communication is the written word, but the telephone is becoming an increasingly important communication instrument in distance education.

Basic to Holmberg's definition are two elements both of which can be considered essential:

- the separation of teacher and learner
- the planning of an educational organisation.

The separation of teacher and learner is fundamental to all forms of distance education whether they be print-based, audio/radio-based, video/television-based, computer-based or satellite-based. This separation differentiates distance education from all forms of conventional, face-to-face, direct teaching and

learning. (Holmberg, 1974) The structuring of learning materials and the linking of these learning materials to effective learning by students through an educational organisation differentiates distance education from private study, learning from interesting books or cultural television programmes. (Keegan, 1983: 8)

AUDIO-CASSETTES IN TEACHING AND LEARNING

What do audio-cassettes have to offer distance education, and how may one compare their potential with other distance teaching media? As Durbridge (1984 : 99) points out, it is useful to note that there are two elements embedded in the one word audio-cassette: first a sound element and secondly, the fact that this sound is presented for study on cassette.

The Audio Factor

With regard to sound, it is likely to be significant in any teaching context that more often than not what is recorded is the sound of the human voice. At first sight, this is an obvious point, but one which provides advocates of the medium with some cogent arguments for the use in distance education.

As Marash (1962) points out, the human voice can be modulated, meaning "the correct and artistic use of pitch, sound, pace, pause, phrasing, inflexion, tonal amount and quality." Thus, a student who is invited to work with a modulated text rather than a printed one can be said to have certain advantages: for example, he or she has access to audible clues about the intended meaning of particular words and phrases in a text, or about the kind of attention he or she should pay to parts within the text as a whole. (Durbridge, 1984 : 99)

Perhaps even more telling for many students is the power of the spoken word to convey enthusiasm, humour and indeed a human touch to their academic study. (Le Roux, 1985) An Open University study into the characteristics of effective teaching (Gibbs and Durbridge, 1976) showed an overwhelming stress amongst senior staff on the importance of personal style; a style categorised as "interesting, systematic, understanding, informal and flexible." It appears quite clear that it is a characteristic highly regarded by both appointing personnel and by students.

Student feedback on Open University (Durbridge, 1982) and Unisa (Le Roux, 1978) courses for example suggests that lecturers who adopt a friendly, personal approach in their cassette teaching are very highly regarded. Such a style appears to be educationally effective for the way it can evoke the sense of a one-to-one tutorial for many listeners, and appears to draw even the distant student towards active and practicipant work rather than passive and unthinking listening. It is then, the fact of modulation which distinguishes a spoken text from a written one and which can provide it with educational advantages.

The Cassette Factor

As we have seen, there are ways an audio medium can achieve more, or certainly different, things from a written one. There are, however, some well-rehearsed arguments against the sound medium, perhaps the most common ones being its ephemeracy and the fact that many students are more experienced at handling (and thus better able to work with) written texts. As Durbridge, 1984 : 100) points out, it might be worth noting that students who are campus-based also suffer from these difficulties, if lectures and tutorials predominate as a teaching method.

For students, study material presented on cassettes offers considerable freedom. Students can choose to listen at a time and place convenient to themselves and thus use the material as and when it appears most relevant to their individual needs. (Bates, 1983 : 233-234)

Students can moreover exploit the hardware of cassette-players - the stop, pause and replay devices - to organise their study approach according to personal style and preference. Thus, it can be argued that cassettes provide students with a learning medium which shares many of the advantages inherent in a written text; it is adaptable to such study techniques as skimming and reviewing and listeners can, to a large extent, control the pace and methods with which they engage with particular content.

As compared with a written text, the spoken word on an audio-cassette can influence both cognition (adding clarity and meaning) and motivation (by conveying directly a sense of the person creating those words.) (Durbridge, 1984)

DESIGNING AUDIO-CASSETTES

Many Open University cassettes are presented for study in combination with visual material, in the belief that this will help listeners to concentrate on the spoken text, and also provide the potential for simultaneous study activities. Indeed, from the teacher perspective, cassettes can be said to be a very valuable medium for the flexible way they lend themselves to a wide range of teaching strategy, if the educational potential of asking students to pause, replay and so on is borne in mind when a programme is designed. (Durbridge, 1984 : 101)

The basic study package at Unisa, of course, relies heavily on the written or printed word, but many aspects of the subjects taught at our University are also taught by means of other media such as audio programmes, slide-sound programmes, and video programmes. Such other media may reveal new, additional and interesting facets of a subject.

During 1984 a Media survey was conducted at Unisa, in order to establish the extent of students' acces to the different media and it was found that 93,1% of the student sample have access to an audio cassette player. (Van den Bogaerde, 1985 : 6) It may also be worthy of note that 92% of the sample group of students have access to a telephone, 78% to a video playback facility, 59% to a slide or slide-tape projector and roughly 22,7% to a micro-computer.

At present audio-cassettes are fully integrated with study packages, after several investigations were undertaken into the use of cassettes at discussion groups, as tutorial letters and to mark assignments, and the use of cassettes were found te be most useful.

Audio-cassettes are often used to introduce tutorial matter to students and in this way guide them in planning their studies for the year. If the cassette is in informal conversational style, the lecturer may bridge the distance between him and the student and create almost a person-to-person relationship. In this case no additional information should be conveyed and in no sense should this type of cassette be a lecture. The talk should explain the approach used in the course and what is ex-

pected of the student in the year that lies ahead. It should also relate the contents of the course to previous knowledge and place it in perspective within the subject as a whole.

Audio-cassettes may also be used to explain difficult sections of the work. (Freysen, 1985 : 37-39) In the course of the year a lecturer may gather (from feedback received, poor assignments, personal contact or during group discussions) that students are experiencing problems with a particular section of the work. When this happens it is possible to record an explanation, even a discussion between a group of academics, which throws light on the problem, and then distribute the cassette as a tutorial letter. (Van den Bogaerde et al., 1985 : 77)

At Unisa audio-cassettes may be used in at least two ways to supply students with feedback about assignments. Firstly, the cassette may be used to supply general comment to all students. After an assignment has been marked, it is possible to determine common patterns of strengths, weaknesses, pitfalls, approaches, and so on, among the group of students enrolled for the particular course. It is then useful to inform the whole group about these trends that have emerged so as to give them guidance for further assignments and even for the examinations.

Secondly, a cassette with individualised comment on an assignment may be sent to each student. Comment is usually written on the assignment cover and in the margins for the student to read, but it may be recorded instead of written. In other words, the lecturer will sit with a cassette recorder while marking the assignments and instead of writing comments he will record them. (Van den Bogaerde et al., 1985 : 78)

This method may not be applicable in courses where student numbers are very large, but where there are few students it may well lead to a more personal approach. It must also be borne in mind that oral comment takes up less time than written comment and hence may be more detailed and meaningful.

Research undertaken by Le Roux (1986) investigated the use of audio-cassettes as an aid to the marking of assignments. Participating lecturers completed a schedule to help indicate whether or not the use of cassettes saved time. Findings reveal

that no time is saved, with cassettes generally taking three times longer than written comments per comparable assignment.

At Unisa cassettes may also be integrated with the study guide. The most common method is for the study guide to present a unit of work followed by a series of short questions. The answers may then be either included in the guide or recorded on a cassette, which is sent out with the study guide. An integrated cassette of this nature adds a personal touch and moreover uses the auditory sense as part of the process of reinforcement. Cassette of this nature must, of course, be planned in conjunction with the study guide. (Van den Bogaerde et al.,1985)

Cassettes may be used to spur students on just before examinations. The drop-out rate at Unisa between the time of gaining examination entry and the writing of the examination gives cause for concern. Lecturers therefore try to instil staying power in students during these two to three months. A cassette reviewing the year's work, with general comments on assignments and guidance for the examinations, may well motivate students to greater effort and give them the courage to write the exams. (Le Roux, 1978)

In sum, cassettes, together with the technology of cassette players, provide unique opportunities for encouraging distant students to be mentally alert as they study, and to participate in activities which will probably make their learning more effective and enjoyable, and for giving support with the whole business of studying at a distance. (Durbridge, 1984 : 104)

PRODUCTION

Just as at the Open University, the production process of audio-cassettes at Unisa has various stages. First of all, an academic will usually work on their text and tape at home, with a tape recorder. He or she can thus develop an integrated script entirely alone and according to well-developed and individual practice. When the draft text is ready, it will be discussed and edited in the studio. All Unisa cassettes are produced by a highly qualified sound technician working in the University's own sound studio. The master-tape is then sent for fast copying. This is done by the Department of Educational

Technology, which has its own in-house copying facility. Thousands of copies are made each year, using a reel-to-reel quarter inch tape in a continuous production process. The tape is then cut, packaged into cassettes, and mailed directly to students with their other study materials.

Unisa is now producing many hours a year of new cassette material in this way. It thus mails roughly 280 000 cassettes per year to students; a marked change from 1977 when cassettes were used in much smaller numbers.

COSTS AND AVAILABILITY

The production of individual tapes can be minimal, merely involving the purchase of a blank cassette, its recording and its postage. (Durbridge, 1984 : 105) It costs Unisa an estimated 80 cents, from master-tape to delivery to a student's house, to provide each individual with one hour's worth of audio material.

Moreover, students keep the cassettes they are sent since it is not cost-effective to demand their return and re-issue to other students. This means that one hour of sound (on a C60) providing usually about two to three hours of study material, works out at less than 40 cents per hour of study. It may be an even more cost effective resource if students go back to their cassettes frequently, for revision purposes, for example.

As Durbridge (1984) points out, compared with newer technologies it is probably fair to say that audio-cassettes provide a very cost-effective and problem-free teaching medium. It is Open University experience again which suggests that most students (usually more than 90%) will already own the necessary replay equipment, and where this is not the case, they will either readily purchase or borrow it. This is also, as we have seen, true in the case of Unisa. (Van den Bogaerde, 1985 : 6)

Student access to cassette content is not, therefore, seen as a problem, and nor is students' willingness to use it. Most distance students say that they find audio-cassettes a convenient and easy medium to work with and typically rate them very highly amongst the mix of media they meet on their courses. Ease of use quite probably influence students' high regard the most.

CONCLUSION

There are several reasons, says Bates (1983 : 233), why audio-cassettes are so popular in distance education. The academics like them, because they feel they have more control over their use, and can integrate cassettes more tightly into course design. Cassettes can be used in a variety of ways - for mastery learning, for commenting on diagrams, charts, tables or text, for backing up or commenting on other media (cassettes have been found extremely useful for analysis of linked television programmes), as resource material (bringing recordings of real-life situations, conversations, interviews, and so on, which are then analysed), or for specialist lectures that explore the wider significance of the course subject. The use of two channels - sound and vision - in a controlled and integrated way, through the combined use of cassette and print or "media," is a very powerful medium.

Students like audio cassettes. In a majority of courses, (Bates, 1983; Le Roux, 1977) they are ranked as the most useful component after the correspondence texts. In a few courses, they have even been ranked as the most useful component of the course. The features that appeal to students are their convenience (they can use cassettes whenever they wish to study), the control students have over them (they can play parts of the cassette as many or as few times as they need), and their informality. Students frequently comment that cassettes are like having a personal tutorial with the course author in the student's own room, a quality that appears to be lacking in radio programmes, however skilfully they are made. Cassettes have a production style and process very different from that of radio programmes.

I therefore agree with Tony Bates and see audio-cassettes integrated with correspondence material as a major area for development in distance education: they are cheap, easy to control and make, convenient for students, and above all, educationally effective.

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THE TELEPHONE AT UNISA

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1. INTRODUCTION

When it comes to convenient remote communication, the telephone is undoubtedly at the top of the list. So indispensable has this instrument become that hardly any area of public or private life can function satisfactorily (or, indeed, function at all) without it.

As a matter of interest, the telephone has been associated with instruction right from the start. In fact, Alexander Graham Bell was an educationist whose main concern was the teaching of deaf children. In 1873 he was appointed professor of voice physiology at the University of Boston, Mass., and his research into the electrical transmission of the human voice contributed much to his invention of the telephone in 1876.

At Unisa the telephone has a very special function. Distance tuition implies distance communication. While Unisa as a distance university communicates with its students mainly by the written and printed word, students for their part prefer the telephone whenever feasible: oral contact is more personal, more direct, and infinitely faster than correspondence.

Given the vital part played by the telephone in the Unisa set-up, the University is obliged to keep abreast of developments and to use the latest, most sophisticated equipment. And although, after 111 years, Bell's

invention still serves its original purpose -- enabling people to communicate orally over long distances -- the great inventor would probably not recognise his brain-child if he were to visit the Unisa telephone exchange now.

2. PRESENT EQUIPMENT

2.1 The electromechanical exchange serving the Theo van Wijk and A.J.H. van der Walt Buildings

(a) Capacity

This exchange has 54 incoming and 49 outgoing Post Office lines and 1 430 internal extensions.

(b) Disadvantage

The traffic via this exchange has increased to a point where incoming calls cannot always be handled immediately. Even for outgoing calls there is not always a line available. The pressure on this exchange will continue to mount as student numbers increase.

(c) Its use as an educational aid

Although this exchange is not equipped with the latest technology, it can be coupled to a number of facilities: the conference telephone, the loudspeaker telephone and the telephone answering machine.

(i) The conference telephone.

The Post Office offers a telephone conference service which can link up a maximum of six lines worldwide.

Since Pretoria currently has only one switchboard equipped with this facility, only one such conference can take place at a time. For that reason, the Post Office requires an indication of the length of the conference when the call is booked.

The present maximum for conference calls is six lines because the switchboard has only six keys for such a connection. However, if one or more participants are connected to a high-technology exchange that has a conference service, they could link up with others and thereby increase the number of participants. The convener has to arrange in advance for all participants to be at their telephones at the set time: the Post Office does not notify them. A conference call would cost the same as a trunk call from Pretoria to each of the numbers concerned. The cost can be debited to any telephone number, even if it does not belong to any of the participants.

The conference service is available after hours and over weekends, but there is no reduced rate. Conference calls have to be booked at least three days in advance.

(ii) The loudspeaker telephone

A loudspeaker telephone (which has to be purchased by the user: the Post Office does not supply the instrument) makes it possible to involve up to ten students in a single call between two points (say, Pretoria and Cape

Town). Loudspeaker telephones are currently in operation at all Unisa's regional offices (Cape Town, Durban and Pietersburg). Unfortunately a bad line or instrument at one or both ends will affect the quality of the entire conference.

The advantage of a loudspeaker facility is that no advance booking is necessary. Users are therefore not tied to a specific time.

A conventional loudspeaker telephone is not essential. Any stronger or better loudspeaker system could be connected to a telephone to give improved transmission and reach a larger number of students.

Although a loudspeaker conference call can be rather costly, it may nonetheless be an economy when it cuts the need for travelling by academic and administrative staff.

Personal (voice) contact between student and lecturer is invaluable, and here too the loudspeaker conference telephone serves a useful purpose. For instance, a lecturer could prepare a slide programme for a certain lecture and provide each outlet with a copy of it. A student at the other end could be requested to act as chairman of the conference and to project the slides, while the lecturer himself gives the talk. If the lecturer would like students to be able to visualise him, he could include a photograph of himself in the programme.

Such a lecture or conference could moreover be recorded, duplicated and sent to students who were unable to attend the conference.

(iii) The telephone answering machine

For the further convenience of students, a telephone system can be equipped with an answering machine. The Unisa library has such a machine, which students can use 24 hours a day to order books or extend loan periods. Answering machines have also been installed in a number of departments for the use of students who encounter problems outside office hours. The student is given a fixed length of time to read his message into the machine. The following day it is transcribed and passed on to the lecturer concerned. Such a service has considerable psychological value. The student knows that if he gets stuck, say late at night, he can phone his problem in at once -- while it is fresh in his mind -- and it will receive attention the very next day. It must be noted, however, that departments are issued with telephone answering machines only in cases where the Management Committee -- which has to authorise such a procedure -- is satisfied that there is a genuine need for them.

2.2 The electronic exchange at the Administration Building

This exchange currently has 42 incoming and 34 outgoing Post Office lines and can handle a maximum of 800 extensions. It is a digital exchange offering numerous up-to-date facilities. For instance, up to eight people can hold an internal telephonic conference -- a useful expedient when dates have to be set for meetings. The convener is spared the trouble of phoning each participant individually to establish a time and venue that will suit everybody. Students, too, can call in quickly and inexpensively because the exchange can be programmed in such a way that no incoming calls can ''get lost'': the ''number'' which the student is dialling is in fact a code that can call up to 32 extensions. In the past a student had to try a series of individual numbers. Now he dials a single code, and the exchange

automatically finds an unengaged extension in that code group. This facility saves students a great deal of time and frustration, especially those phoning in from remote areas. Many of our students who live in rural areas do not have a telephone and have to drive or walk long distances to get to one.

Since not all telephones in South Africa are automatic, certain calls have to be booked via the Post Office. Sometimes such a call is delayed because the number is engaged. This problem, too, is relieved by the above code system. The figure of 1 500 or so calls per day made to the Administration Building during the registration period provides some indication of what this system can do to facilitate telephone traffic.

2.3 Telephone traffic handled by the two exchanges

The two Unisa exchanges together handle about 4 000 outgoing calls a day and, by Post Office count, about the same number of incoming calls. There is no suitable internal method for measuring the traffic between the two exchanges, but it is undoubtedly very heavy since the 20 connecting lines are constantly engaged.

3. FUTURE DEVELOPMENTS

3.1 Installation of a new high-technology exchange

The continuing growth in student numbers will probably force the University in the near future to replace its existing exchanges with a single high-technology system. Such an exchange would greatly facilitate the distance-tuition process. Not only would it provide improved voice transmission but it could also be coupled to data bases, videotex, teletex, telex and text,

thus facilitating the exchange of information. It has been suggested that the University should investigate the potential of other, related facilities such as the electronic mailbox, facsimile transmitter and toll-free telephone system.

These systems make it possible to bring in the most advanced facilities -- videotext, for instance, which could take the place of Beltel. It might even be known as ''Unitel''. Beltel would be far cheaper, however, since students in whatever part of the Republic would pay for a local call only: this would not be the case with videotext.

3.2 The electronic mailbox

A telephone answering machine can be replaced by the so-called ''voice mailbox'', which differs from the former instrument in that it can handle more than one call at a time. All academic and administrative departments could be furnished with such a ''mailbox'', which would work as follows:

A student dials a Unisa number, identifies himself by means of a small electronic device which also enables him to ask for a connection with a certain mailbox. He then has up to 5 minutes to record his message.

Various research projects in the telecommunications field have shown that about 30 percent of all attempted telephone calls are unsuccessful because the party called is absent or the line engaged. As a considerable proportion of all calls consists of one-way information, a voice-mail system can solve the problem in many of these cases. This system allows for a variety of procedures to improve availability.

In the standard case a message is transmitted from a registered user to the mailbox of another user. By means of a simple procedure, a message can also be sent in answer to a received message.

A voice-mail system saves a great deal of time because communication is more concise than in the case of normal dialogue. It also eliminates enquiries such as ``Is Mr X in?'', as well as waiting-time. Messages can be sent during reduced-rate hours, as the recipient who has a mailbox need not be present. Examples of applications: messages can be sent and recorded, listened to, redirected with comments, or forwarded. It should be remembered that the student has to make a trunk call to Unisa whereas the lecturer only needs to make an internal call. Therefore a student can call Unisa 24 hours a day from anywhere in the world, and his message will be listened to, and responded to, from anywhere in the world. The number of mailboxes available would depend on the size of the exchange and the number of simultaneous calls to an individual mailbox on the number of ports available. If a mailbox has 20 ports, 20 callers can talk to the mailbox simultaneously for up to five minutes each.

The disadvantages of such an electronic system are its high cost and the fact that a student, to make use of it, has to purchase a small electronic touch-tone generator.

3.3 Facsimile transmitter

Another useful device that is compatible with any type of exchange is a facsimile transmitter: a modern, highly efficient desk-top machine designed to transmit A4 pages of handwritten, typed, printed, pictorial and other graphic information worldwide over an ordinary telephone line. Transmission is very fast, cost low and copy quality excellent. An enterprising student

could even transmit an assignment, or examination papers could be sent to the various regional offices.

3.4 Toll-free telephone service

Another device that would greatly promote communication between students and University is a toll-free telephone service, which is currently the subject of a market research project by the Department of Posts and Telecommunication. The Post Office would assign one or more numbers to the University. Calls to these numbers would be paid for by the University, not by the caller. *Obviously such toll-free calls would entail considerable cost to the University*, quite apart from the cost of the facility itself. The only advantage would be that students could telephone the University free of charge.

4. CONCLUSION

What the University needs today is better information management in order to cope with the ever-increasing flow of information.

The world is changing, computers and worldwide telecommunication networks are joining forces. There is a pressing need to improve productivity and efficiency and to cut costs.

To keep up with its telephone traffic, which is mounting in direct proportion to student numbers, the University might find it advantageous to install one large, high-technology exchange which can be expanded to meet fresh needs without interrupting the existing service.

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UNISA AND BELTEL : A MARRIAGE OF CONVENIENCE?

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1. INTRODUCTION

Unisa has the need to communicate with its students in a more personal and in a much less time consuming way than is possible with the use of the existing postal infrastructure. Beltel has the potential of satisfying this need. For Beltel to be a success, however, it needs a large number of users throughout the country. Unisa with its many students has the potential of satisfying this need.

Is it possible for these two parties to get together and form a relationship with more meaning than a mere marriage of convenience?

Beltel is the commercial name of the videotex service of the Department of Posts and Telecommunications. Videotex is an electronic communication system which uses the existing telephone network to transfer information between computers or allows direct access to certain data bases or computers.

It is thus possible for a Unisa student to make use of his existing telephone line, his existing television set and some additional equipment to access Beltel. The student will then be able to interactively communicate with a data base created by Unisa. The student will not only be able to obtain information from the data base but will also be able to send information to the data base. Depending on the type of services offered by Unisa it would be possible for a student to get immediate feedback with regard to certain enquiries. If the information required is not available at

the time of the request he could leave an electronic message in this regard. As soon as the information has been gathered it could then be forwarded to him electronically via Beltel, thus saving time.

2. Beltel and distance education

The usage potential of Beltel for distance education can be divided into several categories. Beltel can be used as -

- a teaching communication medium,
- an externalised memory,
- a computerised training medium and
- an administrative or statistical resource.

2.1 Beltel as a teaching communication medium

A lecturer could for instance use Beltel to communicate with groups of students or even individual students to help them to solve problems or use their existing study material (books, study-guides, multi-media packages) efficiently. A student on the other hand could send a message to a lecturer and expect an answer within a day or two. This reduction in the turn around time of communication is one of the greatest advantages of using a system like Beltel.

2.2 Beltel as an externalised memory

When used as an externalised memory Beltel is used to complement the library services offered to students. Excerpts from books or articles could be made available to students and updated on a regular basis. Especially rapidly changing information can be passed on to students as soon as it is available.

2.3 Beltel as a computerised training medium

The structure of the Beltel data base is of such a nature that study material can be programmed without expert knowledge of computer programming languages. Because the Beltel system allows communication between computers it would be possible to transfer computerised study material from a central computer to the computers of students, enabling them to complete the training modules in their own time. Authoring systems which help the lecturer to design such training modules are available.

2.4 Beltel as an administrative and statistical resource

It is possible to link the computers used to process the administrative and statistical information needed by a distance education institution to Beltel. In effect it means that the number of access terminals to these computers can be increased and decentralised to a great extent. If, for instance, all financial institutions were linked to Beltel and public Beltel terminals were installed at all Post Offices, virtually all Unisa students would be able to register for study and transfer the necessary funds from their home towns. This would reduce the amount of paper work involved, with a concomitant saving in time and money.

3. The Unisa Beltel project

During 1986 it was decided that Unisa should offer certain services to its students on Beltel on an experimental basis. Because only a small percentage of Unisa students have access to Beltel the extent of the services offered had to be limited. The services were divided into two sections:

- general information and services and
- academic services to registered students.

The section on general information and services includes a project initiated separately by the Department of Library Services of Unisa.

The objective of the Beltel project is to ascertain the usefulness of Beltel within the Unisa context by offering certain services and then monitoring the response of our students. As a starting point it was decided to concentrate on general information and services.

3.1 General Information and Services

An existing information pamphlet was used to create a data base offering the following services to students:

- general information,
- requests for information,
- initiation of the enrolment procedure and
- library requests or renewals.

- **General information**

  By simply accessing Beltel and selecting the appropriate choices a student can reach the first page of the Unisa data base. With the aid of indexes the student is led to information on the nature of distance education as practised by Unisa, the Unisa campus and regional offices, the use of Unisa calendars, examinations, and the cost of study at Unisa. Information on the most important degrees, the different faculties, requirements for registration and a list of under-graduate subjects is also available.

- **Requests for more information**

  If a student needs more information he or she can complete a data input page on Beltel. The request for more information is sent to the relevant department at Unisa.

The department then has the choice of either answering via Beltel or forwarding the requested information by post. If a student prefers not to use Beltel in this regard he or she is referred to a page on Beltel containing information regarding personal, telephonic and written requests.

- **Initiation of the enrolment procedure**

A student who wishes to enrol at Unisa is referred to a section containing information on registration' dates, the documents neccessary for registration and the normal registration procedure. Because the computer which is used for registraion purposes is not linked to Beltel the only additional service offered is that a student can request enrolment forms by completing a data input page. The enrolment forms are then forwarded to the student by post and he or she then has to follow the normal registration procedure.

- **Library services**

The library project enables a student to access general information on the library services, to request or renew library material, and to send a message to the Department of Library Services.

3.2 Academic services to registered students

The only service offered in this section is that students can send messages to lecturers by completing a data input page. The message is sent to the relevant lecturer who has the choice of either replying via Beltel or by post. Depending on the availability of the Beltel service to students and further research projects initiated by particular departments at Unisa the following services are inter alia possible, but not available at this stage:

- information can be sent to students,
- results of assignments can be displayed,
- programmed learning modules can be run,
- data with regard to research projects can be collected,
- data with regard to exams can be collected, and
- results of exams can be displayed.

4. Planning for the possible use of Beltel

At this stage no reliable research data is available with regard to the Unisa Beltel project as it was initiated only at the beginning of the 1987 academic year. It is however possible to derive some guidelines from our experience and the literature on videotex in general. It seems that the following three topics, especially, need to be addressed thoroughly when planning for the possible use of Beltel:

- the basic design of research and other projects,
- the creation of an infrastructure and
- planning for the production of the information to be displayed.

4.1 Basic design of research and other projects

Obviously the appropriate didactic, research and media principles will have to be selected and considered systematically when designing projects. A multi-media approach should be followed and as far as possible it should be endeavoured to integrate the projects with other academic and administrative services. It is also important to keep in mind that Beltel has many possibilities but cannot, on its own, solve all the problems in a given situation.

- **Co-ordination of different projects**

  When a data base is accessed via Beltel it is difficult to ascertain what the structure of the data base looks like because only one page of information is displayed at a time. To avoid confusion on the part of users it is suggested that within a particular institution all projects should be co-ordinated and combined into one data base. The data base should be managed in such a way that at least the following aspects are co-ordinated:

  - the data base design (overall and projects),
  - the data base administration (registration, accounts and hardware), and
  - the technical maintenance of the data base (page and routing control).

4.2 Creation of an infrastructure

When planning for the possible use of Beltel it is necessary to create an infrastructure that will cope with all contingencies. The structure of the data base should be designed to allow for additional pages and projects without having to change existing page design, page numbers and routings. If expansion is envisaged an infrastructure should be created to cope with in-house editing, the interfacing of computers and the availability of user terminals. Planning in this regard will undoubtedly save time and manpower that would otherwise be wasted if page design, page numbers and routings have to be meticulously changed and checked.

4.3 Planning for the production of the information to be displayed

To ensure that the facilities offered by the Beltel system are used optimally, that the appearance of the information displayed is acceptable and that editing and the creation of pages can be done with ease, it is advisable to inform everybody involved in a

project about the data base design and structure and about basic Beltel page design. With regard to data base design and structure they should know how their project fits into the overall data base and how users will be routed to their project from indexes and how users should be routed from their project back to the relevant indexes. They should also be informed about the limitations and possibilities with regard to basic page lay-out, graphics, colour, special features (like flashing text) and the interactive options available on Beltel.

5. CONCLUSION

When one considers Beltel in general it seems as if the possible applications are limited only by one's imagination. Within the Unisa context however there are a few practical limitations. The most important limitation is that so few Unisa students have access to Beltel. This problem could be alleviated if the Department of Posts and Telecommunications were to install a large number of public Beltel terminals, or if Unisa were to estblish many more regional centres - where terminals could be installed. On the administrative side the greatest limitation is the cost involved in adapting existing computer programmes to make them compatible with the Beltel system in a user friendly mode.

It is, however, important that research be done to determine whether the above-mentioned marriage could be a lasting one and to delineate the position of Beltel in a multi-media approach to distance education.

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THE UNISA BELTEL PROJECT

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UNISA library

I. HISTORICAL PERSPECTIVE

1. BELTEL: a modern communication medium

The South African Post Office (SAPO) officially announced the creation of a videotex service, based on the British PRESTEL protocol, and launched the trial service early in 1981.

After several years of indecision about which protocol to settle for, SAPO eventually decided to support all three available protocols, PRESTEL, CEPT and ASCII, indefinitely.

The Library quickly recognised the inherent possibilities of BELTEL, and in 1983 an investigation was launched into the potential of BELTEL.

Two internal reports compiled in 1983 by senior library personnel covered all the important aspects of the subject:

- the possible library applications of BELTEL
- the equipment needed to use the service
- how to become a user
- the costs of using the service.

On the strength of these recommendations it was decided that the UNISA library should consider becoming a BELTEL user as soon as possible and that an investigation into the further the possibilities offered by the system specially that of providing information on BELTEL should be launched immediately. The consensus of the reports was that the potential is enormous and that technology must be kept up to date for fear of being left behind.

The BELTEL Marketing Service (BMS) took the place of the trial service in 1984 and teething troubles were still busy being sorted out until well into 1986. The more troublesome were failure to log on system down and pages disapearing.

2. BELTEL investigated

In the beginning of 1985, the AMBIT Business Services, a member of the Southern Life group, a South African Life Insurance company, offered UNISA, via the Bureau for Teaching Development, two BELTEL terminals as well as editing access to their own BELTEL database.

One of the incentives to make use of the AMBIT offer was that Southern Life was planning to equip, in the long term, most of its offices countrywide with BELTEL terminals. 400 terminals were mentioned at that stage. These could have been used by UNISA students during quiet times to communicate with the university.

The Bureau for Teaching Development sent a circular letter to all departments, informing them of the available facility. This elicited some interest from a few teaching departments like English and Linguistics and a renewed interest for BELTEL in the library. An expanded and updated report was submitted in 1985.

This report made recommendations, several of which were taken up further, namely that BELTEL should be used:

4.1 **to provide information to users about the library service**

4.2 **to receive messages from students**

and about:

4.3 **Placement of terminals in select centers.**

These recommendations formed the basis and gave rise to what was to become the Library BELTEL project.

In October 1985, the ideas were handed over to a workgroup with the brief to **investigate the possibility to implement on BELTEL a requesting service for books and periodicals - particularly recommended books - which would allow students having access to a BELTEL terminal to send their requests through to the library.**

3. Testing BELTEL

3.1 Using the AMBIT database

After the abovementioned meeting, the project was handed over to the author who was requested to provide a schedule for the planning of the system as well as a tentative outline and content for the "electronic pages" needed to get the system off the ground.

tentative outline and content for the "electronic pages" needed to get the system off the ground.

Some time was spent gathering the information needed for input to the system and using the editing terminal to key in the information onto the AMBIT database.

The fact that UNISA library was investigating the use of BELTEL was acknowledged in a short article in the UNISA-NEWS of November 1985. It was mentioned there that students in possession of BELTEL equipment would be able to request books from the library in the comfort of their own homes.

In the meantime, the person responsible for the BELTEL project at AMBIT resigned and their operations ceased rather abruptly. A letter from Southern Life was received shortly afterwards, in March 1986, announcing the termination of their agreement, but assuring that our pages would not be erased from their database until we had made alternative arrangements. This news precipitated the request for a research grant from the university authorities.

3.2 The library BELTEL project

A formal proposal for a research grant was thus made which set the wheels of the project earnestly in motion. UNISA became an Information Provider (IP), and originally 100 "electronic pages" were rented to accomodate our library database. An order was placed with Philips for three work stations with 14inch screens which could be delivered at short notice.

The first work station was quickly delivered, the two others a little later. All the "General Information" pages were keyed and recorded on tape. Another terminal was used in the library for editing and further testing.

The general information pages are largely based on the pamphlet **Study at UNISA 1986** which contains general information about registration requirements, studies at UNISA, subjects offered, fees, ways of communicating with the university and so forth. The information found on BELTEL was specially adapted for the medium, some of it was entirely new, being added as the project progressed in order to fit the new medium.

Meanwhile, the library pages were refined and were ready for use by the time the project was approved. Because of the lack of a "bulk transfer" facility, our pages were transferred from the AMBIT to the BELTEL database.

After the transfer, some students quickly found their way to the university's pages and some requests were received long before the project was made public. To explain the preceding, a little advertising help was received when Infotel, an Information Provider on BELTEL, created on the system a **Universities and Technikons Index** which routed inquirers directly to the UNISA pages.

The project proposal stated that three suitable sites had to be found in the chosen testing areas for the terminals. The Johannesburg Study Centre, a reading and study room sponsored by the Johannesburg business community for the use of UNISA students was the obvious choice for the first site.

Bloemfontein and Pietermaritzburg had already been tentatively chosen because of their geographical locations, the former being in the Orange Free State province where no UNISA link existed and the latter being the first great student grouping without communications link anywhere in South Africa. There are three regional offices, including a full branch library, in Durban, Cape Town and Pietersburg, as well as library depots in Windhoek and Port Elizabeth.

The directors of the public libraries in Pietermaritzburg and in Bloemfontein were contacted and both responded quickly and enthusiastically to the news of the project and to the request for assistance.

Telephone lines were installed and user registration organised for the three test sites in order to monitor the costs separately.

The first terminal was implemented in the Johannesburg Study Centre on the 10th September 1986. No problems were experienced at all, neither from the staff of the Centre, nor from the students who responded very positively to this new medium. In fact the response for that short month was very good: 87 requests from 37 different students.

The next two terminals were implemented at the end of September and the beginning of October in Bloemfontein and Pietermaritzburg respectively. No problems were experienced there either.

4. <u>The test phase</u>

Training was provided for two to three days at each of the sites to familiarize the staff in charge with the terminals and their operation and monitor the situation in order to make them feel comfortable with the new

equipment. Unfortunately no students were available on the premises at Bloemfontein or Pietermaritzburg to test the system live as it was almost the end of the academic year and no one had been warned of the impending implementation of the terminals.

As from the 1st December 1986, all newly registered student for the 1987 academic year receives, together with his/her tutorial matter, a little pamphlet setting out to explain BELTEL, its uses and where it is available. Several enquiries have already been received in connection with BELTEL from interested students.

Statistics so far this year have not yet shown much student interest. It is however still early in the academic year to predict anything either way.

An advertising campaign is now under way to increase student awareness of the service. This will include radio and press releases in the major local and national radio stations and newspapers.

II. PROJECT SPECIFICATIONS

1. Project description

The original objectives of the project, mentioned in the research proposal were to assess the following:

- the viability of the system as a communication medium for UNISA students
- the problems involved with rendering such a service
- the demand that is likely to be made on the system
- the actual cost of rendering the service

2. Expected Results

The results expected form this experimental project are examined below:

2.1. The viability of the system as a communication medium for UNISA students will be determined by the collection of various statitistics as listed below:

- the number of BELTEL requests for library materials or for renewal

- the number of requests per test site

- the number of requests from other areas in the country

- the number of BELTEL queries

- the number of students using BELTEL at the test sites

- the average time taken by BELTEL requests to reach their destination, compared with postal requests

2.2. The problems experienced in providing the service will be highlighted by:

- reports from the various test sites
- student queries received on BELTEL
- letters from students

2.3. The demands that are likely to be made on the system will be measured by further analysis of the statistics collected previously:

- the number of BELTEL requests

- the number of requests per test site

- the number of requests from other areas

- the number of BELTEL queries

- the number of students using BELTEL at the test sites

2.4. The actual cost of rendering the service will be determined by the computation of all costs involved:

- hardware (cost of dedicated terminals)
- editing time
- telephone communications
- computer connect time
- other expenses incurred (specific items such as plastic covers for the various manuals)

These costs will be kept separately for the three test sites and for the UNISA campus, although the costs for the latter will be difficult to assess as there will be some overlap with other projects using BELTEL.

3. Choice of test-sites

As few people at this stage have private access to BELTEL, the project has made provision for terminals to be made available at selected points, from which students, initially at the University's expense, could request the library material they require.

The first test site chosen is the Johannesburg Study Centre where BELTEL will provide a faster link with the Main library.

The second test site (Pietermaritzburg) will examine the effect of having a BELTEL terminal placed fairly close to our busy Durban branch library. Pietermaritzburg is 80 km away from Durban.

The third location has been chosen to be Bloemfontein in the Orange Free State because it is furthest from any existing branch library and still has a sizeable student population.
Although the project is restricted to these three specific areas in the country, all our students will be informed about the project as those already in possession of BELTEL equipment, at home or at their place of employment, will also be able to use the system.

4. Uses of BELTEL

Firstly, BELTEL can be used to read the general information pages supplied by the library. These pages give a little background on the library and contain highlights of the Library Regulations as well as instructions on how to request library materials using BELTEL.

All types of library materials, books, periodicals and audio-visual materials can be requested by filling in "data collection" frames modelled on our existing postal request cards. Renewals are also possible using a similar frame.

In addition, a free-text message can also be sent for any matter concerning the library.

This information is transferred to the UNISA library mailbox instantaneously, via the BELTEL computer, thus eliminating postal delays of on average 5 days or more, at a per request cost (excluding equipment and BELTEL fees) of a little more than that of a postal request.

A manual for the use of BELTEL at the test sites was compiled both for the users of the system but also for the staff members dealing with the users. Staff members at the main library were trained to receive incoming requests and print them.

5. The future

Once BELTEL has proved its viability, the logical way to extend the service would be to call on all libraries connected to BELTEL to come forward and offer the use of their facility to UNISA students. This could prove to be to their own advantage, since by accomodating UNISA students in this way, it could take considerable pressure off their already stretched supplies of books which our students use to the detriment of these libraries' patrons.

UNISA could also increase the geographical coverage of BELTEL by increasing the number of terminals in use by providing terminals in many more public libraries in key areas for the ultimate improvement of the communication between students and the library and for improving access to their study materials.

The next technological step, will be to link our computerised library system with BELTEL by means of a gateway. This will offer our students direct access to our catalogue inquiry facility as well as reservation of books already on loan. Greater use could also be made of the mailbox facility to answer student queries and give speedier feed back on unsatisfied requests.

III. Conclusion

Videotex has great potential where a real need for this type of service really exists, as is the case in South Africa where great distances hamper the rapid flow of information.

The growth of the service so far has been kept in check by the unfavourable economic conditions that have prevailed in the past few years. The recovery of the economy and the reduction of inflation could herald great strides in the expansion of the service.

The library's **BELTEL project** is only a part of a wider experiment by UNISA. It is planned to be used as a means to expedite requests for library materials, renewals and general library queries. Technically, the service is working well and provides some students with faster access to library materials than was previously possible. It is not yet very well supported for lack of awareness of the system but use will improve following the advertising campaign now on.

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COMMUNICATION MEDIA AND DISTANCE EDUCATION (MEDIA DESIGN AN INTEGRAL PART OF COURSE DESIGN)

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1. INTRODUCTION

"It may be that the most striking effects of instructional planning are to be found in various **combinations of media**, where each may perform a particular function best" (Gagné, 1971: 72, 73). Because distance education, in essence, is no different from any other education or instruction for that matter, Gagné's view could be applied to the media used in distance education. Sadly, however, distance education is mostly pauperized by the use of only one medium - **printed words**. Thus there are no striking learning experiences for the learner to savour because no media combinations are possible. This may be a harsh view of the present situation but it should at least be a warning to those of us who have become complacent with regard to our teaching. Don't we owe it to our students, who are paying to be educated, to offer them more meaningful learning experiences in return rather than just letting them educate themselves? On the other hand, language is the essential teaching meduim, but it must not be taken for granted when designing learning experiences. "All forms of communication rely on 'language' of some kind or another - whether algebraic, 'body language' or computercoded, the 'ABC' is there to be acquired and used, and underlies even what are regarded as non-verbal forms of communication .... whatever my meduim, whatever form of language I use it must be lucid, precise and effective" (Pereira, 1986: 130). These **'languages'** pertain to the **symbol systems** that we use when we **communicate** with our students. Certain symbol systems are best conveyed by certain **media** but certain media also inherently have 'languages' of their own (the language of film, the language of photography).

When communicating with our students our objective is to share meaning (Roelofse, 1987). To share meaning is to, inter alia, divide it and distribute it but also to have it in common, which is in essence the purpose of teaching. To achieve this we need some kind of language or symbol system to communicate by and an appropriate medium to convey our messages. Has the time not come to remove the bias toward the type of symbol systems used in print and to treat the various media as equal (Greenfield, 1984: 161)? Research has shown that there is no one particular medium (including the printed word) which is best suited for all learning tasks and that most instructional functions can be performed by most media (Schramm, 1977: 43).

Should we not concentrate on selecting combinations of media and symbol systems to achieve the striking effect of transforming mere ready knowledge into functional knowledge in the minds of our students. Is it fair that our students have to plod around in a quagmire of facts and concepts while we have the experience, the comprehension and the maturity within our subjects to structure and organise these facts and concepts into meaningful learning experiences?

This is no mean task but it is our responsibility. It is also obvious that it cannot be achieved by only considering the media and symbol systems that make it possible as an after-thought when planning instruction or designing a course. Media design should be integrated with course design and one should at least make allowance for the properties and functions of media and the media options that are available.

2. THE PROPERTIES OF MEDIA AND COURSE DESIGN

In general it can be said that all media convey content, coded by symbol systems, by using technologies and that they are associated with different situations in which they are typically used (Salomon, 1979: 14). Media differ and concur in their potential of affecting

learning mainly because of the different symbol systems that can be accommodated by the technologies involved.

The symbol systems or 'languages' that are chosen to code a particular message prescribe the different media that can be used to convey the message. At this stage the didactic situation should have been analyzed and media selection then involves only choices of a technological nature with regard to the modes of gathering, packaging and presenting information (Van Deventer, 1986: 107). The fixative, manipulative and distributive properties delineate these choices (Gerlach & Ely, 1980: 8,9,10).

- **Fixative property of media**

  This property enables an object or event to be captured, preserved and reconstituted in time. A particular event or object can thus be recorded by means of the technology of a medium and preserved for later re-use and analysis. In this way an event or object can be transported through time.

- **Manipulative property of media**

  The way in which a particular object or event is perceived can be transformed in many ways by using this property of media. Action can for instance be arrested (still photograph) or reversed (reversed video playback). Events can be speeded up, slowed down (video play back) or edited (time lapse recording) and presented in a re-sequenced format.

- **Distributive property of media**

  This property allows an event or object to be transported through space. If an object or an event has been recorded (on film, magnetic tape, or printed page) it is possible to reproduce it in almost any location at any time and as often as necessary. Mass distribution systems, such as television and radio have the potential of increasing the number of recipients of messages dramatically.

Although there are many instructional development models a potential course designer can choose from, the models appear to be very similar in design, structure and content (Gustafson, 1981: 47). A comparison of different models indicates that in course design information is gathered and analysed and decisions are made with regard to the didactic situation, the objectives of the intended course, the appropriate learning experiences, the content involved, the necessary learning opportunities and the evaluation strategy that should be followed. While deliberating these interrelated aspects it is also neccessary to decide (especially in terms of content) which symbol systems are needed to ensure appropriate learning experiences for students. As already mentioned this will imply certain media options. These media options can be narrowed down by simply considering the above-mentioned three properties of media. **This approach implies that media design should be an integral part of course design in order to select media which are appropriate and convey our messages in an accurate and meaningful way.** This assumption is supported by the fact that, in his taxonomy of instructional development models, Gustafson (1981: 15) found that media selection or development was an inherent characteristic of the 13 models that he had considered.

3. VIABLE MEDIA OPTIONS FOR DISTANCE EDUCATION

Only those media options that pertain to situations where the lecturer and the student are separated by large distances will be considered.

- **High tech options**

  "Whatever its future may be, the university of tomorrow will be serving in the information society." (Smith & Dunn, 1985: 5.)

  "No doubt the Wired Nation will be upon us in a decade, or sooner. (Hill, 1981: 18.)

"It is now technically possible to store information in any format (audio, visual, digital or any combination of these), retrieve it whenever we want, and send it instantaneously, anywhere in the world." (Winn, 1985: 2.)

Taking the last statement (made in 1985) into account and considering the technological advances that have been made over the past few years the first two statements do not seem too far fetched. Distance education institutions should sit up and take note. If they do not, they could be caught unawares by technological developments at the end of this century and not have done the necessary research and planning to utilise the possibilities available at that time.

At this stage video conferencing with simultaneous facsimile transfer is already possible. Videotex and Teletext are two other options.

Television and radio broadcasting has been available for quite some time with the added possibility of satellite linkage.

Cable television is another possibility with large channel possibilities.

Videodiscs, compact discs and digital tape recordings are already available, opening up interactive possibilities.

Communication networks based on the optical fibre or open space as transmission channel pose even more possibilities for distance education.

These are but a few of the exciting high tech media options that are available at this stage, and it seems as if there really is a convergence of technologies opening up even more possibilities and combinations.

- **Media options within the Unisa context**

Unisa students are spread throughout the country and have rather limited access to sophisticated play-back equipment. We are thus limited to the following media when we have to distribute information to all the students following a particular course simultaneously:

- printed words,
- printed diagrams,
- printed illustrations,
- printed photographs,
- photographs,
- photographic slides,
- sound cassette programmes,
- slide-sound programmes, (synchronized tape, slides not mounted) and
- combinations of some of the above.

If simultaneous distribution to all students is not neccessary we could add the following media to the list:

- books,
- telephones,
- telephone conferencing,
- video programmes,
- complete slide-sound programmes,
- compact discs and
- records.

Although we are limited to the above-mentioned media it should be possible to design meaningful learning experiences for our students by selectively combining different media into an integrated study package (Van den Bogaerde, Gous & Yule, 1985: 76) according to the symbol systems prescribed during course design. In this way it should be possible to design

a study package which effectively enables a student to achieve to the limit of his potential and which could be seen as an extension of the lecturer's teaching capabilities (Haasbroek, 1986: 97).

4. FUNCTIONS OF MEDIA IN DISTANCE EDUCATION

4.1 Basic functions of media in distance education

Obviously the main function of media in distance education would be to **enhance** the **communication** between the lecturer and the student. Students and lecturers studying and teaching at a distance, however, do have unique problems. A few may be summarised as follows:

- isolation from both the lecturer and fellow students,
- difficulties in stimulating 'affective learning',
- a limited amount of (and delayed) feedback,
- difficulties in teaching certain topics,
- a lack of personal contact and
- difficulties in maintaining motivation. (Jenkins, 1980: 9)

A multi-media approach is ideally suited to solving many of these problems because it leads to **improved access** to alternative modes of teaching and learning, which again helps to **reinforce learning** and understanding. It can also **increase motivation** by introducing a greater variety of approaches to stimulate and restimulate interest. The **learning experiences** of student can also be **enhanced** if the main medium is wisely supplemented by other media when necessary (Jenkins 1980: 18).

4.2 Relationship between media functions and course design

Media perform the central function of conveying information in the process of communication between lecturer and student. Media thus form an intergral part of the implementation of a course and media design should form an integral part of course

design. This view is supported by the fact that when a list of general media functions is compiled from the literature most of the functions correspond to the concerns that are addressed when a course is designed. Consider for instance the following list of **media functions:**

transmit information,
serve as role models,
assist with the practice of specific skills,
contribute to the provision of feedback,
motivate,
save learning time,
structure learning material,
supply new realities,
supply different avenues of approach,
stimulate interest,
improve quality,
improve equity,
improve participation,
personalise,
supply previews and advance organisers,
promote discussion and perusal,
express in different ways,
control the order of access,
enhance interaction and
guide through written course material.

(Armsey & Dahl, 1973: 8; Laaser, 1984: 4; Laaser, 1986: 8; Marland & Store, 1982: 90; Rebel, 1974: 19; Rebel, 1985: 57; Rumble, 1981: 80; Wilkinson, 1980: 11.)

Obviously one could find many more but compare these functions of media with the following checklist for the designing of a learning experience for distance education compiled by Adey (1987: 7):

Checklist for the creation of a learning experience for distance education

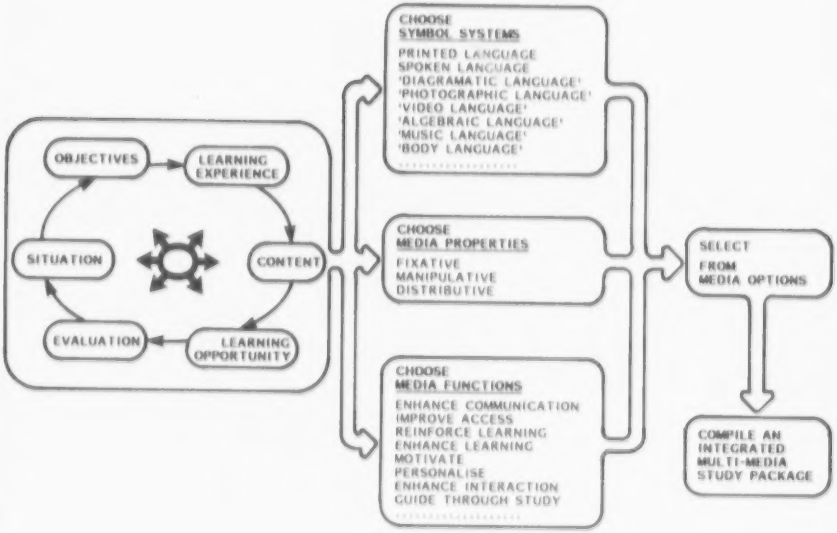
1. Prepare the student
2. Activate and maintain motivation
3. Provide models of behaviour for mastering
4. Expect active responses
5. Provide step-by-step guidance
6. Provide repeated opportunities for practice
7. Provide immediate feedback
8. Organize a graduated sequence of presentation
9. Design for individual differences
10. Change from an information dispenser to a manager of learning experience

There seems to be an uncanny resemblance between the two lists. I would however like to propose that it is a very natural resemblance - two sides of the same coin, perhaps - and that the above-mentioned **symbiotic relationship between media design and course design cannot be argued away.**

5. CONCLUSION

In conclusion it is first of all suggested that for the symbiotic relationship between media design and course design to result in truly meaningful learning experiences for our students, it should be evaluated continuously. Each step in the design process should be evaluated to ensure that its influence on the final result is a positive one. Secondly to put theory into practice, what has been said thus far could by applied by using the structure depicted below.

Figure 1 Media design - Course design



Finally it is suggested that we enrich the learning experiences of our students by using those media that best perform the functions identified in course design. We should let the content do the 'talking' when we choose a 'language' to communicate by and keep in mind that a balance between independent and interactive activities should be maintained (Daniel, 1985: 6).

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SUPPLYING LIBRARY MATERIALS TO UNDERGRADUATE STUDENTS OF A DISTANCE TEACHING UNIVERSITY

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THE IMPORTANCE OF THE READING PROGRAMME FOR TEACHER, STUDENT, AND LIBRARY

The teaching method of UNISA is that of guided self-study. The UNISA student is older and more experienced than his residential couterpart. He must be determined and highly motivated to overcome the obstacles of distance education. As an independant adult learner working alone at the distances of time and place from his teacher (or academic guide) the motivation and responsibility for learning falls heavily on the student. As he is cut off from classroom lectures and seminar discussions and from the informal learning experiences of the residential university the whole burden of learning falls on the reading programme and on his assignment work.

The teacher's responsibility is that of designing the syllabus and selecting the reading programme to achieve his educational purpose without burdening the student with irrelevant material. The teacher then guides the student through his learning process with written comment on the content and scope of the subject matter. This educational process involving the teacher and learner as equal partners may be termed "guided self-study."

The reading programme is the centre of the teaching/learning process for most of UNISA'S structured undergraduate and post-graduate courses. The success of the learning process, and, indeed, the ability to earn the credit points needed to gain entry to the examination, are often crucially dependant on access to books from the library. Problems surrounding the supply of library materials to students of structured courses are therefore of vital importance to teachers and students in achieving their objectives, as well as to the library.

TERMINOLOGY

Prescribed works are those regarded by the teacher as essential for the course. As the student must buy these works the library stocks only a small number of copies. Recommended works are those a teacher draws to the attention of students for special study. As students are advised to consult them they are duplicated in sufficiently large numbers by the library to meet the similtaneous demand of students registered for the

relevant course. Students may be advised of other additional works that may be of interest in their studies but which are not central to their reading programme.

LITERATURE

A survey of the literature in this field reveals little to illuminate the problems of library services to students of structured courses at UNISA. The UNISA library appears to be unique in its service to a very large student body by means of the large scale duplication of recommended works, and in the limited role played by the public library system in the provision of such materials. The limited attention devoted to the role of the library in distance education has also been remarked on by Brockman and Klobas. (1983, p.7)

THE ROLE OF THE LIBRARIAN IN THE UNDERGRADUATE TEACHING PROCESS

We have seen that the reading programme is the central element in the student's learning process and that it is a key feature in the educational strategy of the distance teacher. The teacher and librarian, as agents of education of the university, share as a common goal the success of the student. The librarian is the information partner of the teaching team. His role is to make it possible for the undergraduate student to have access to the materials his teacher specifically wants him to consult at the time they are most useful to him, usually shortly before the due date for his assignment. The more ambitious student will also need access to a wide range of additional sources, supplementary to those specifically recommended for his reading programme.

The librarian's responsibility for creating access to recorded knowledge for undergraduates includes the provision of user assistance services, by means of which undergraduates who use the library by post or in person are given the help they need to locate recommended and additional sources.

The librarian's tasks as information partner in the teaching team include bibliographic advice to the teacher in the selection of books and other study materials that are commercially available in sufficient quantity to make the title accessible to students of the course; obtaining reprints

and obtaining permissions for books of readings, as well as the order and supply in good time of adequate copies of recommended materials to satisfy student demand.

The current role of the undergraduate services librarian includes that of bibliographic advisor to teaching staff in the selection of materials that are readily available to their students, and as bibliographic advisor to the student in the location of recommended and additional materials and in the further use of the library.

If the success of the teaching programme depends to a large extent on the student getting timely access to materials specifically recommended for a course, then the librarian needs to be involved at an early planning stage to advise on procurement and availability. Access to books when they are needed is to the student of distance education equally as important as the appositeness of their selection as study material. Yet access and choice are interrelated; compromise may be necessary between the best title for teaching purposes and the availability of a title on the library shelf in sufficient quantity to make it accessible to the distant student in good time. The teaching schedule may, for its own sake, have to accommodate the realities of the book trade, especially in time of increasing political action by overseas suppliers and tightening budgets.

To be educationally effective a recommended title must firstly be appropriate to the learning needs of the student; it must be commercially available; it must be ordered in time to be accessible to the student when he needs it most; it must be available in sufficient quantity to supply all students who wish to use it; and the cost must be within the library's (and hence the University's) means to supply. This situation can only be brought about if librarian and teacher collaborate as an educational team with the joint aim of promoting the learning process of the student. The need for coordination of the parties involved in distance education has also been stressed by Hayworth. (1982, p.160). For collaboration to be successful awareness is needed on the part of the librarian of the educational strategies of the teacher, and on the part of the teacher of the bibliographic exigencies of the library.

EDUCATION VIA STRUCTURED COURSES: AIMS AND STRATEGIES

A structured course is one that ends for the student in an examination and consists of a structured learning programme usually based on reading and assignment work. Most structured courses are undergraduate, but honours and masters courses may also be structured, while many undergraduate courses have a limited research component at advanced levels.

Teachers have long cherished the personal freedom as to the choice of course content and teaching method. Despite subjective preferences of individual teachers it is possible to generalise concerning the aims and methods of teaching as it applies to structured courses, at least on undergraduate level. An indication of a broad consensus in this field is to be found in the form of guidelines published by UNISA as Policy on formal teaching. (1984) Not only are such policy guidelines important for teachers but they also inform the library and all other members of the educational team of the goals and methods of university education.

This document stresses several teaching policies that are relevant to the reading programme and the undergraduate responsibilities of the library. The three essential aims of undergraduate education are set out:

- "the transmission of factual information but more particularly, the developing of intellectual skills; the pursuit of knowledge;" (Policy, 1984, p.1)

  and

  "...the instilling of a critical ability in students." (Policy, 1984, p.3)

The teaching policy guidelines of UNISA stress not only the learning of the subject matter of the courses, but also the acquisition of ways of learning considered by the academic world to be an essential part of a university education. It is at least equally important that the product of such an education should be an independant and critical thinker as that he should become a learned person, equipped with

"...intellectual skills that enable independant selection, retrieval, evaluation and mastering of knowledge and the ability to reproduce it clearly;"

and

"...an increasingly critical, responsibly receptive attitude to points of view." (Policy, 1984, p.4)

The preoccupation of the educationist in the distance teaching university context can therefore be summarised as

- the imparting of knowledge
- the development of intellectual skills such as analysis and evaluation
- the development of a critical approach to the theories, opinions and findings of others via comparative reading and the application of intellectual skills to a variety of source materials.

At first year level the emphasis falls on the imparting of a foundation of knowledge for the subject field. In later years of study increasing emphasis is laid on independance of judgement and critical assessment.

THE NEEDS OF STUDENTS OF STRUCTURED COURSES FOR LIBRARY SERVICE

The student needs access to a title which has been recommended to him by the teacher, and he often needs this access at a particular time of the year to complete an assignment, or to fit into a work programme or a learning sequence. If the title he needs is not available in the library, or if it is not available in sufficient quantity, or not available for the due date for which it is relevant, the student experiences a learning problem. Even though there may be perfectly acceptable substitutes for the problem title in the library, experience has shown that most students will reject substitution unless the teacher has specifically indicated the possibility. The library has neither the specialised subject knowledge nor the authority to recommend specific substitutions, although the attention

of students may be drawn to other books on the subject field.

In view of the acceptance at UNISA of the assignment as a basic teaching tool, and the recommended book as assignment reading, it is salutary to consider Howe's contension (1983, p.89) that "...to require answers to the same questions, requires that all students have access to the same information sources..." If teachers expect the acquisition of basic knowledge via assignment work it is essential that all their students have timely access to the same or similar recommended reading.

The student also needs a variety of sources on his subject field to enable him to build up a balanced view and to enable him to exercise his critical faculties. Undergraduate students in particular need advice on locating books in the library and on finding materials in various media on their subject field. Many disadvantaged students have had little or no exposure to library service of any type before beginning their studies with UNISA. They may also have received schooling that has left basic gaps in their preparation for library use, such as a limited experience in alphabetisation, and a lack of familiarity with the concept of catalogues. For these students in particular user assistance services are of great importance.

FUNCTIONS AND PROBLEMS OF SERVICE TO STUDENTS OF STRUCTURED COURSES

TIME : THE CENTRAL DILEMMA OF SUPPLY

The central problem of library service to large numbers of distant students who face fixed due dates in their work programmes is that of time. A student may need to consult a title at any time during his study programme, but the institution of due dates for assignments ensures that the need for specific titles will be similtaneous for very large numbers of users, and the demand concentrated. If a copy of the needed title cannot be supplied within a period of between a month and a week before the due date it is of little value to the student. Human nature being what it is peak demand for a specific title is bound to fall within this period, and use "bunches" in the month before the due date for an assignment. The importance of timeliness in service provision is stressed by Brockman and Klobus (1983, p.73) in the findings arising from their study.

The time problem is currently solved by money. Large numbers of copies of a title are bought so as to ensure availability during the short period of peak demand. The supply function of services to structured courses in distance education must respond to the same educational realities as it does in residential circumstances, ie it is designed to cope with demand peaks of relatively short duration. Whereas the residential university's library can ration use of the book during peak demand by shortening the loan period to a matter of hours, the necessity of posting copies to distance students and awaiting the return of the book, makes the purchase of large numbers of copies per title essential.

Rationing a limited number of copies by instituting a waiting list (the traditional library response to spreading its limited resources) is at best only partially effective in the specific circumstances faced by UNISA's undergraduates. They simply cannot wait for a book, and if it is received too late to contribute to an assignment much of its value is lost to them, although it may nevertheless contribute to their study of the course as a whole.

Library resources could be more rationally and economically employed if the demand for titles could be spread throughout the academic year. Improved access to titles would benefit the student, and assure the teacher that his teaching programme was in fact capable of realisation through access to books. Fewer copies could be bought and used more consistently. A meaningful waiting list could optimise the use of resources. Whether or not the access problem caused by the time dilemma can continue to be solved by the application of large quantities of money depends on the willingness and ability of the University (and South African society) to support an inherently sub-optimal system.

An obvious mechanism for evening out demand is to spread the due dates of a student group in such a way that demand is recurrent rather than similtaneous.

If time is the crucial element in serving distance students then the library must cut its internal processing time to the minimum. For the student the time between sending the request and the receipt of the book is crucial. To speed up the first, postal, stage followed by the request,

the library is evaluating the use of BELTEL.

On receipt the requested item must be located and posted with the minimum of delay. The sheer volume of work implied in a student enrolment of 90 000 + presents an administrative problem, as books which students do not return, that go missing or are misfiled, will peak just when student demand is greatest and when the system is under its greatest seasonal pressure.

The turnaround time, ie between student A returning a book and student B receiving it, is an important administrative problem for the librarian in distance education.

STOCK DEVELOPMENT AND MAINTENANCE

The key decision concerning stock development, the choice of the titles to be recommended, is part of the course design responsibility of the teacher. This decision must, however, reflect the overall policies of the University and its ability to pay. For this reason the Senate has established broad guidelines within which titles are recommended. Covered by these guidelines are matters such as the length of time a title must remain in use before it can be withdrawn, and the maximum number of copies that can be recommended for a course unit. Bearing in mind the high cost of books and the disturbing waste of resources represented in books that are prematurely withdrawn, such guidelines are essential.

In spite of the large proportion of its book budget that the distance teaching university must spend to keep its students of structured courses supplied with books for their studies and assignment work, it must be remembered that they represent for many students their sole use of the library. The quality of service from such a department is thus of considerable significance to this sector of the library's user group.

ASSISTANCE TO USERS

Although UNISA is primarily a distance teaching university it has many students who use it in much the same way as they would the library of a residential university. In fact the over-the-counter issues of Study

Collection books amounted to 64% of the total issue of its books in 1986. The greatest proportion of enrolled students live in the Pretoria-Witwatersrand-Vereeniging area. Some students live close enough to use the main library in Pretoria, or the Study Centre in Johannesburg on a regular basis. In addition there are branch libraries in the main population centres. It appears that many students, through unemployment or preference, are studying on a full-time basis through distance education, and therefore have the time to use the library in person.

The establishment of branch libraries in main population centres has reinforced this trend. As a result it has become increasingly necessary to give attention not only to the needs of postal requesters, but to the needs of those who use the library in person.

Studies of user needs, specifically of user failure to locate needed materials, have been undertaken in the UNISA library. Studies done by Froneman (1986) and de Beer (1986) reached several important conclusions, of which the following have a bearing on the increasingly significant personal use of a library conceived primarily for distance education.

- A significant percentage of students failed to find the books they sought, despite the fact that the books were correctly filed on the shelves (de Beer, 1986 p.2; Froneman, 1986, p.5)

- Missing and misfiled books posed a problem for students (Froneman, 1986, p.10)

- The need on the part of students, especially undergraduates, for a service that not merely answers students questions, but provides help and anticipates problems, needs much attention. (Froneman, 1986, p.13-18)

- The distance student may visit a library only seldom, and, in countries where distance education provides an opportunity for mass education, many of these may be the products of an education system which lacks school libraries of substance. The educational system itself may be weak in many respects, so that the student may be not only unfamiliar with the use of libraries, but may be weak in basic

skills such as alphabetisation. Therefore Froneman cautions against assumptions concerning the ability to use conventional methods of library organisation, however "obvious" of "simple" these may appear to the librarian. (Froneman, 1986, p.17)

Based on observational experience and the findings of the Froneman report user assistance services for personal users of the library need to concentrate on two problems experienced by students, namely the findability of books and other library materials, and help in using the library system to achieve their purposes. Findability is addressed by user-oriented instuctional media, such as broschures, signs and notices, videotaped guides, individual assistance and guidance, and the prompt reshelving of returned books and continuous shelf-order checking. Help in using the library system should be provided in written form as well as by way of interpersonal guidance. The importance of user education in library services in distance education is strongly supported by the Special Interest Group on Distance Education of the Library Association of Australia. (Guidelines, 1982, p.20-21).

For postal users the objective in distance education remains to ensure that library users who do not make personal use of the library receive instruction in the use of libraries in general by way of written guides and workbooks.

FUTURE DEVELOPMENTS

The provision of library services to students of structured courses in distance education faces several problems:

- Duplication of titles on the scale needed to satisfy the demand of a large student body is expensive. The service provided is an essential one in terms of the currently accepted values and teaching methods of tertiary education. Continuation of the present system will depend on the willingness and ability of the university and society to support these values and methods.

- Sources of supply of bulk orders for recommended works are threatened by the increasing tendency to sever trade links with South Africa.

- The supply of postally requested material to distance students is a labour-intensive undertaking. It is repetitive work requiring speed and accuracy. It is hoped that new computer systems will automate much of this process.

CONCLUSION

Services dealing with the needs of students of structured courses in distance education need to be regarded as a specialised field of study and operation. Their problems and solutions are unique in the library field.

Librarians must communicate the problems and necessities of service to teachers so that they are aware of the educational implications of their actions with regard to their reading programme for students. An active partnership needs to be developed and maintained between teacher and librarian to reach shared educational objectives.

Adequate funding and staffing are basic requirements for the success of services to structured courses. They are expensive and labour-intensive services, but they are essential for the great majority of the student body.

Alternatives to the large scale duplication of whole titles need to be investigated. It satisfies the academic aims previously discussed, for example, to supply the distance student with a package of reprinted material rather than with a list of books to order. The package would perform the same educational function as the books for the distance student, and would reduce for the student the waiting time implicit in the postal delivery system, waiting lists and other delays.

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POST-GRADUATE STUDENTS AND THE LIBRARY AT A DISTANCE TEACHING UNIVERSITY

Robert Poller
Library Services

1. Introduction

The previous speaker dealt with the library service which is extended to the undergraduate student, that is, the student following a structured course. This paper is concerned with the service offered to the student following an unstructured course, which in practice means a few honours courses, nearly all masters courses, and all doctoral students.

2. Differences between students at a residential university and UNISA students.

There are several marked differences between postgraduate students at a residential university, and those at UNISA. As these have a definite bearing on the kind of library service which is needed, I will briefly sketch some of the more relevant ones:

2.1 Access to library

At a residential university the student has full, personal access to the library, and may, in fact, spend most of his time there. At UNISA, this cannot be taken for granted. Most students have limited personal access to the main reference collection located on the campus in Pretoria:

Whilst a fair percentage of students are within commuting distance of the reference collection: some are located so far away that a visit is not a practical proposition. Many are in full employment, allowing personal visits only during limited periods such as vacations, or after normal working hours.

Not only are our students in full-time employment, but in the case of post-graduate students, they are often engaged in senior or managerial positions, and their family commitments are also more demanding. With residential students such commitments are the exception rather than the rule.

2.2 Library expertise

By the time a student at a residential university reaches post graduate level, a fair measure of "library literacy" can be expected. Unfortunately, this assumption can not be made for UNISA students.

- the UNISA library has only recently commenced a programme which teaches library skills to undergraduate students. It will, however, be quite a few years, before this will have any effect on post-graduate students

- the library exposure which a typical UNISA student has had during his undergraduate years does not prepare him for independent library-based study. To date only a few dapartments have attempted to teach their students library or research skills, whilst the undergraduate library provision, as the previous paper has shown, is based on the concept of multiple copies of intensively used reading material.

- lastly, our post-graduate students come from a culturally diverse society, and many have experienced different basic undergraduate teaching methods. Some may return to the university after having been academically inactive for years, and may be thoroughly out of touch with their intended course of study, some may have attended universities which possess rather rudimentary libraries, and any library skills they may have gained at that stage, may be a totally inadequate grounding for dealing with this computerized information age. Whereas with residential universities the pattern is for students to progress from undergraduate to post graduate studies, with little if any time in between, this is clearly not the case with UNISA students.

The inference to be drawn from these factors is obvious that a traditional university library service based on the concept that the student will visit the library and do his research, more or less independently there, has little chance of success at UNISA. The circumstances in which our students function have to be taken into consideration, even though this may lead to the repeated accusation that UNISA students are spoon-fed.

3. Development of subject reference services at UNISA.

We realised more than twenty years ago that a traditional structure based on the requirements of residential students would be inadequate to meet the unique needs of our post graduate students. In 1966, four experienced librarians were seconded from the existing staff, and the nucleus of what was to become the subject reference division was formed. From this small beginning, there has evolved a department of 30 staff members, with a strongly developed service philosophy, which operates within clearly defined objectives and uses standardized methods to meet the information needs of our post graduate students.

4. Structural organization

Initially, the existing forty or so academic departments were evenly allocated to the four librarians, and each assumed responsibility for a specific group of departments. Providing an adequate service to such a diverse group proved to be a virtually impossible task - a librarian could be responsible for all the language departments as well as mathematics and chemistry.

Fortunately, these pioneers managed to give a creditable performance against what must have been daunting odds and steps were taken to increase their numbers. It was thus possible to allocate fewer and more closely related subjects to each librarian, thereby also increasing the chance of finding librarians with suitable academic backgrounds. Today, we have sixteen librarians dealing with 56 academic departments.

Whilst we may never reach that state of utopia where we have one librarian with the right academic qualifications per academic subject, the present stage of development is more than acceptable. At the present time, the department as a whole consists of 30 librarians, who in addition to other functions, provide a unique reference service to our post-graduate students.

The subject reference librarians are organized into four groups, corresponding to the faculties of the university. Each group is led by an experienced senior librarian. Most reference librarians have a more junior librarian as an assistant to help them with the more routine tasks.

5. Initial contact with students.

On registration, each student is sent a personal letter. At least, by courtesy of a word processor it appears to be "personal" in which the librarian introduces herself, and invites the student to make contact with her should he have any literature/information or library needs. At the same time, a file is opened on the student, in which all dealings with the student are recorded. Frequently, this letter of introduction is not necessary, as we may already have had contact with the student prior to registration. While we do not perform any time consuming services for unregistered students, we will assist them in various ways by, for instance:

- allowing them use of the library (on the recommendation of a lecturer) so that they are able to do preliminary reading befor finally deciding upon a topic

- showing them relevant reference sources, or providing them with copies from our stock of previously compiled bibliographies

- letting them browse in our records of completed South African research, or assisting them in obtaining a listing of this from other sources, such as the Human Sciences Research Council.

It has also become customary for some lecturers to bring a new student to the library and introduce him to the reference librarian, after the student has made contact with the academic department in person. This probably constitutes the ideal situation, as the student can usually be helped in one way or another whilst still brimming with enthusiasm, and seldom leaves the library empty-handed.

6. Further contact.

Every year the list of registered students is checked against our files, and if we have no record of the student having contacted the division, a renewed invitation by means of a "personal" letter is extended. This is continued for as long as the student re-registers. Overall, 68% of the students are active users of our service in one way or another. One can but speculate as to why 32% do not make use of us. Reasons that have been advanced include the following:

- a small number of students drop out anyway

- some students (such as lecturers from other universities, staffmembers of large organizations) have access to specialized information services and do not need us

- some research is conducted in archives or consists of some kind of field work, were reference services are not required.

7. Services provided

A student can contact us in person, which is the most satisfactory way, but also by means of the telephone, by letter, by visiting the branches, and latterly, even by using BELTEL. Whichever way we are contacted, we will provide the same range of services to the student:

7.1 Advice on bibliographic style and research methods

We have collected an extensive selection of guides on bibliographic style from all over the world, and encompassing most disciplines. Whilst some academic departments have very specific preferences in this matter, and inform the student accordingly, others leave it up to the student. In the latter case, we can advise the student as to what would be suitable in his case.

Likewise, it is not unknown for students to find out the hard way at the end of their research that they will have to re-examine many of their references, as their record keeping left out vital elements. We have a number of books covering most disciplines on research methods and record keeping, that will provide guidance in advance to the student on a suitable approach befitting his discipline.

7.2 Locating material on a topic

Depending on the individual requirements (and there each case differs), we will:

Help the student to find material in our library himself, by using our catalogue or other reference aids such as indexes and abstracts.

Explain the workings of more specialized reference tools to the student, and suggest alternative sources over and above the ones with which the student may be familiar.

Provide help in locating journal articles on a topic.

Help in tracing obscure references.

Provide copies from our stock of compiled bibliographies.

Compile bibliographies, where there are special needs.

Advise the student about locating materials in other libraries and institutions.

Obtain or puchase materials not in the library collection.

8 Compilation of bibliographies

The compilation of bibliographies is perhaps the most controversial aspect of our service. There is a school of thought, particularly amongst older academics, that compiling a bibliography is really something which the student should learn by doing himself, and that no librarian could possibly compile it for him. We, on the other hand, maintain that there are bibliographies and bibliographies. Whilst the final bibliography of a research project must be the responsibility of the student or researcher, the compilation of general bibliographies is a task for which librarians have special training, and the student or the lecturer has not.

This has become all the more important with the advent of the computerized data banks. The reference division has been accessing overseas based computerized information vendors since 1979, and has been a pioneer amongst universities in South Africa in this field. Apart from the overseas vendors, some of which allow one to search amongst 120 million bibliographic references in a time span of minutes, we also utilise the local vendors such as SABINET and INCH (Institute for contemporary history, Bloemfontein)

The popularity of the bibliographies can be seen by the steady growth in numbers: we are now compiling them at a rate of 800 per annum, which does not include at least another 1 000, which are the result of data base access, but which are too esoteric to keep for future use. Over and above the currently compiled bibliographies, we have a stock of 7 000 older bibliographies to call upon. Some of these are such "best sellers" that they have been printed, and are made freely available to students. Topics in the latter category include:

"Questionnaire design"
"Research methods and thesis writing"
"British command papers on South Africa"

The advantage of having a stock of bibliographies on hand is that it is possible immediately to give a student a listing of materials on the topic of his choice. Even if it is dated by a year or two, it is useful to identify relevant periodical articles, to indicate the section of the library where books on the topic are kept, and to identify other relevant sources from which the student can make a choice.

9 Selecting materials

An indirect effect that our post-graduate students have on the library, is that this division knows exactly what the library users are demanding. This knowledge is essential for book and periodicals selection, and is a by-product of our having to assist the user, instead of letting the post-graduate student use the library unaided. As a matter of routine the monograph sections of bibliographies are checked against our holdings, and from items not in stock, new materials are selected to augment our collection.

10 Conclusion

The subject reference division of UNISA has demonstrated that it is possible to extend a quality service to post-graduate students at a correspondence university, and in so doing have developed a model which could be utilized by residential and other correspondence institutions with beneficial results. Growth in student numbers and in the diversity of courses offered will continue to provide challenges to us.

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